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A Randomized Control Trial of Continuous Support in Labor by a Lay Doula

Della A. Campbell, Marian F. Lake, Michele Falk, and Jeffrey R. Backstrand

Objective: To compare labor outcomes in women accompanied by an additional support person (doula group) with outcomes in women who did not have this additional support person (control group).

Design: Randomized controlled trial.

Setting: A women's ambulatory care center at a tertiary perinatal care hospital in New Jersey.

Patients/participants: Six hundred nulliparous women carrying a singleton pregnancy who had a low-risk pregnancy at the time of enrollment and were able to identify a female friend or family member willing to act as their lay doula.

Interventions: The doula group was taught traditional doula supportive techniques in two 2-hour sessions.

Main Outcome Measures: Length of labor, type of delivery, type and timing of analgesia/anesthesia, and Apgar scores.

Results: Significantly shorter length of labor in the doula group, greater cervical dilation at the time of epidural anesthesia, and higher Apgar scores at both 1 and 5 minutes. Differences did not reach statistical significance in type of analgesia/anesthesia or cesarean delivery despite a trend toward lower cesarean delivery rates in the doula group.

Conclusion: Providing low-income pregnant women with the option to choose a female friend who has received lay doula training and will act as doula during labor, along with other family members, shortens the labor process. *JOGNN, 35,* 456-464; 2006. DOI: 10.1111/J.1552-6909.2006.00067.x

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Introduction

The beneficial effects of the supportive care of women in labor by another woman have been demonstrated and replicated by researchers over the past several decades. Meta-analyses of randomized clinical trials have demonstrated that women who have continuous support during labor have a reduction in the Cesarean delivery rate, length of labor, the need for analgesia, operative vaginal delivery, and 5-minute Apgar scores less than 7 (Hodnett, Gates, Hofmeyr, & Sakala, 2005; Scott, Berkowitz, & Klaus, 1999; Zhang, Bernasko, Leybovich, Fahs, & Hatch, 1996). Though the providers of support in these trials have varied from health care professionals to lay family members, the care provided is often modeled after the concept of a "doula," a word of Greek origin that roughly translates as a "woman caregiver." A doula is not a physician, nurse, or midwife; she does not provide any medical interventions in the labor room nor does she supplant the role of the male partner or other family members who may also be in attendance. However, she does provide continuous uninterrupted emotional and physical support throughout labor. This continuity of care, provision of human presence, and social support is unique to the role of the doula and sets her apart from any other model of support for the laboring woman (Gilliland, 2002; Hunter, 2002).

Most women in the United States are accompanied in labor by their spouse or male partner, and women value their partner's presence as extremely important and helpful (Klaus, Kennell, Robertson, & Sosa,

1986). The role of the female companion has been and is an additional support to the laboring couple. Her role is not to replace or usurp the father's role in the birth process. Research indicates that male partners and female companions provide different types of support to laboring women (Bertsch, Nagashima-Whalen, Dykeman, Kennell, & McGrath, 1990). Independent observers found that in the couples where a doula was present, the male partners were noted to be more affectionate and tender toward their partner when compared to couples who did not have a doula.

The services and benefits of a doula are not universally available to women in the United States. Gordon et al. (1999) noted that it was time to reassess what effect a labor companion may have on improving perinatal outcomes since the advances in technology have failed in that aspect. Occasionally, doula programs are available through hospital-based programs or through community service agencies. However, health care systems that serve low-income women may not have hospital-based programs in place through which the women they serve can receive continuous support in labor by a doula. It is the authors' opinion that developing and maintaining such a program may be costly and problematic for a health care agency in terms of a bottom line cost-benefit analysis.

The services of professional doulas are available in many parts of the country. The cost of the services of a professional doula in the authors' tristate region ranges from approximately $300 to $1800. Although grant funded programs may exist that offer subsidization of fees for doulas, in most cases doula services are paid for directly by the woman. The majority of underinsured low-income women cannot afford these services.

In previously reported investigations of continuous support in labor, the person providing the support was usually someone with a health care background (nurse, midwives, student midwives) or someone who had received training as a doula. A friend or family member of the parturient has not traditionally carried out the role of provider of continuous support in labor. Prior to the report by Madi, Sandall, Bennett, and MacLeod (1999), there had been no randomized controlled trial of continuous support in labor provided by a female friend or family member of the mother.

The current study was designed with the benefits of continuous labor support in mind as well as the need for a cost-effective affordable program to provide those services for low-income women.

Review of the Literature

Physiological Benefits of Labor Support

The physiological benefits on the outcome of support during labor (by a doula) are most likely derived from the role of catecholamines. The human response to stress has been documented as the flight-or-fight response expressed through the sympathetic nervous system by production of epinephrine and norepinephrine (Cannon, 1932; Taylor et al., 2000). The opposite of this is the parasympathetic system regulated by the hormone oxytocin and endorphins (Klaus, Kennell, & Klaus, 2002; Lieberman, 1992; Simpkin & Ancheta, 2000). Endogenous catecholamines (epinephrine, norepinephrine, and dopamine) are released when a woman experiences pain, anxiety, and fear during labor (stress). The smooth muscle cells of the uterus contain both alpha and beta adrenergic receptors. Stimulation of alpha receptors result in uterine contraction, while stimulation of beta receptors cause the uterine muscle to relax (Lipshitz, Pierce, & Arntz, 1993). Epinephrine's predominant effect on uterine activity is through stimulation of these beta adrenergic receptors, with a resultant decrease in uterine activity (Klaus et al., 1986; Zuspan, Cibilis, & Pose, 1962). Norepinephrine is linked to alpha adrenergic receptor stimulation in uterine muscle resulting in increased contractility. By infusing various concentrations of both epinephrine and norepinephrine into gravid women who were either in "advanced prelabor" or spontaneous labor, Zuspan et al. (1962) were able to demonstrate this uterotonic effect of norepinephrine and tocolytic effect of epinephrine.

While it is clear that both norepinephrine and epinephrine increase as a result of the pain, anxiety, and physical exertion of labor, each neurotransmitter may be influenced by different factors (Dimsdale & Moss, 1980). By sampling subjects during periods of both physical activity and psychological stress, Dimsdale and Moss were able to demonstrate that while norepinephrine levels rose more dramatically during physical activity and less so during psychological stress, epinephrine levels rose significantly higher during periods of anxiety and less so during physical activity.

Further support of the relationship between epinephrine, emotional stress during labor, and its influence on labor progress is reported in work by Lederman, Lederman, Work, and McCann (1985). Plasma epinephrine and norepinephrine levels as well as self-reported anxiety and observed stress levels were collected from a group of 73 women at several points during labor. There was a positive correlation in phase 1 of labor (3-6 cm dilatation) between epinephrine levels and the level of stress, anxiety, and duration of labor; a negative correlation was seen between epinephrine levels and uterine activity as measured by Montevideo units (Lederman et al., 1985).

Both animal and human research has demonstrated that catecholamine levels increase during labor and that these rising levels reduce blood flow to the uterus and placenta and are associated with a decrease in uterine contractions, slower dilation rates, and longer labors (Adamsons, Mueller-Heubach, & Myers, 1971; Barton, Killam, & Meschia, 1974; Lederman et al., 1985; Lieberman, 1992;