Sticking to the Plan: Patient Preferences for Epidural Use During Labor

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Background: *Women have been shown to value control in the labor experience, a desire that is often formalized into an explicit birth plan. Epidural preferences are a primary component of this plan. Despite this specification, women's plans are not always carried out. This may be due to patient factors (e.g., dissatisfaction with labor), provider behaviors (e.g., frequent epidural offers), or situational variables (e.g., prolonged labor).*

Purpose: *The current study investigates the relative impact of patient preference for epidural use as compared to provider suggestion and circumstances of labor. It hypothesizes that providing an epidural preference in a birth plan and receiving frequent epidural offers will predict epidural administration.*

Methods: *Adult, postpartum women were surveyed about their labor experience at a high-volume obstetrics unit in a medium-sized community hospital. Responses to a structured survey instrument focused on prelabor preferences and labor characteristics. Descriptive statistics and multiple logistic regression modeling were used to analyze participant responses.*

Results: *Eighty-three postlaboring women completed surveys, of which 79 surveys were analyzed. Eighty-four percent (*$N = 66$*) received an epidural during their labor process, while 73% (*$N = 58$*) desired an epidural as a part of their birth plan. Women were offered an epidural at a mean frequency of* 0.27 ± 0.48 *times per hour (median* $= 0.14$*). The significant predictors of epidural administration were desire for an epidural in the birth plan (*$p < 0.01$*) and the frequency of epidural offers (*$p < 0.01$*). Wanting an epidural was associated with receiving an epidural. Conversely, increased frequency of being offered an epidural negatively correlated with epidural administration.*

Conclusions: *Our findings indicate that personal preference is the most influential factor in determining whether or not a laboring woman will receive an epidural. Increasing provider attempts to offer an epidural – as represented by increased frequency of queries – decreased the likelihood that an epidural would be received.*

Keywords: *epidural; birth plan; labor analgesia; patient preference; decision making.*

INTRODUCTION

Though few would deny the value of shared decision making in obstetric management, the extent to which patient preferences should dictate care still remains a controversial issue. The inherently asymmetric patient–provider relationship[1] has been forced to evolve in this particular setting, accommodating shifts in cultural values pertaining to women's involvement in and control over the birth experience. Birth plans, written documentation or explicit verbalization of women's preferences prior to the onset of labor, have played a major role in empowering patients in the labor process. In addition to specifying what procedures women desire or hope to avoid, birth plans are currently seen as a tool for improving communication[2] in that they provide an organized set of talking points, educational objectives, and guiding principles for the healthcare team. A 'good' birth plan, one that is satisfactory to the patient, is largely concerned with women's *control* in the labor process,[3] meaning that these plans represent personal expressions of patient values and expectations.[4] Despite their clarifying intent, these patient-centered plans generally make specific reference to interventions that have traditionally been recommended under the discretion of healthcare professionals, creating the potential for interpersonally challenging negotiations as labor proceeds.

Epidural administration is a particularly meaningful aspect of labor management from the patient perspective, one that has been subject to changing professional opinion over the last decades. In surveying a group of postpartum women ($N = 63$), Pennell et al. found that preferences for pain control (including epidural use) were the most common element of birth plans, followed distantly by preferences regarding invasive interventions

for vaginal delivery, cesarean delivery, and 'natural childbirth' not otherwise specified.[5] Accordingly, epidural analgesia use is increasing for laboring women. Patient requests for epidural pain relief have trended upward from 1995 to 2001, rising from 57 to 66.5% of women interested in having an epidural. Opioid use and medication-free birth have both undergone a compensatory decrease in popularity.[6] Fluctuating patient and provider views on epidural pain control are likely to be implicated in the shift towards its use. Of the common obstetric procedures, epidurals have the largest percentage of patient participation in the decision-making process compared to ultrasound scans, blood tests, fetal monitoring, and cesarean sections.[7] Relatedly, patients subjectively reported feeling informed on the risks and benefits of the epidural procedure. Their level of confidence in epidural knowledge is second only to cesarean section (inclusive of pre- and postlabor procedures).[7]

Patients' apparent comfort in engaging with epidural decision making does not imply that they have an objective understanding of the procedure's indications and maternal–fetal risks. Studies suggest that patients often espouse inaccurate information about epidural use.[8] Multiple surveys indicate that physicians are the least common source of information on epidurals. Family members, friends, and midwives tend to be the primary overall information sources for women constructing a birth plan,[9] where similar sources are consulted specifically on epidural use.[5] Though physicians are not the primary source of patient knowledge, it is their ultimate choice as to whether or not an epidural is placed, a decision that is based on their expertise and preference. The overarching role of physicians in alleviating pain undoubtedly impacts their standpoint on this issue. The inherent tension to respect patient preferences and to offer pain relief is illustrated in the guidelines of the American College of Obstetricians and Gynecologists:

> . . . [With the exception of labor] there is no other circumstance where it is considered acceptable for an individual to experience untreated severe pain, amenable to safe intervention, while under a physician's care.[10]

As both patients and physicians are major stakeholders and active participants in the epidural decision-making process, the rationale behind any given epidural placement is likely to be multifactorial, representing priorities of both parties. However, to the best of our knowledge, no study has rigorously investigated the determinants of epidural use in the context of uncomplicated labor processes taking place in a US community-based teaching hospital. The current study considers women's epidural preferences (i.e., birth plans), providers' encouragement, and features of the labor process as potential predictors of epidural use. Our objective is to determine the extent to which women retain control over their pre- and perinatal analgesic experience through their birth plan specifications.

The central question of our study is as follows: are women's preferences for epidural use (as expressed by their birth plans) the primary predictors of whether or not they receive epidural analgesia during the labor process?

Hypothesis 1: The inclusion of an epidural in a predetermined birth plan is a significant positive predictor of receiving an epidural during labor.

Hypothesis 2: There is a significant direct relationship between the number of times per hour a laboring woman is queried about receiving an epidural and the likelihood of actually receiving an epidural during labor.

By exploring the factors that influence whether or not a laboring woman will receive an epidural, we hoped to determine the degree to which women's preferences are being respected in the labor process.

METHODS

Selection and Description of Participants

Participants were recruited as a convenience sample of postpartum patients admitted in spring 2011 to the 34-bed postpartum Mother–Baby unit of a high-volume obstetrics hospital in central/mid Michigan. The patient population of this community hospital's obstetrics ward is notable for its diversity – a great variety of socioeconomic and cultural backgrounds are represented. Among these are groups for whom sharing de-identified demographic information is an especially sensitive issue (e.g., refugees). Though participants were required to be at least 18 years of age to participate in the study, we chose not to collect specific demographics on individual patients as it may have discouraged certain patients from participating.

Potential participants were asked if they would like to complete a brief questionnaire regarding their labor experience. Medical students on the research team obtained informed consent from participants and read them the questionnaire, transcribing their verbal responses to each item. The environment for survey

administration varied between patients in terms of the presence or absence of family members and the exact delivery to interview time interval. All surveys were completed within 48 hours of delivery. The Michigan State University institutional review board (IRB) exempted this methodology after reviewing our procedures and instrument (IRB x11-1135Se).

Eighty-three participants were recruited for the study. Four subjects were subsequently excluded from the analysis because they did not report an epidural preference before entering the active stage of labor. They reported that they were 'unsure' regarding their preferences for receiving an epidural, reducing the number of subjects from 83 to 79. By definition, the participants that were retained all had some form of birth plan, as characterized in the Introduction section above. The vast majority of the patients surveyed here presented their birth plans as a set of verbal instructions to a healthcare provider. For some, this was realized in general terms (e.g., 'I would like as natural of a birth process as possible'), while others were more specific (e.g., 'I want an epidural'). All of these variants were considered birth plans for the purposes of this study, as long as they gave a clear indication of patient preferences for pain management.

Survey Instrument

The survey consisted of eight closed-ended questions (Table 1) that covered participant intentions on epidural use, evaluation of their current labor experience, and their reflections regarding possible future labor.

Statistics

In order to test the hypotheses given above, we constructed one multiple logistic regression model predicting whether or not our subjects received epidurals. Wanting an epidural as indicated in one's birth plan (Hypothesis 1) and the number of times one was offered an epidural per hour (Hypothesis 2) were included as potential predictors. Number of offers was treated as a rate, meaning that these occurrences were relativized to the length of each woman's labor process (henceforth discussed as 'frequency' of queries). Overall satisfaction with the labor process was also incorporated as a possible mediator of the aforementioned predictors. Number of hours in labor and administration of oxytocin were not integrated into this analysis due to overly skewed distribution of the variants of these factors with respect to each other and our dependent variable. The final multiple logistic regression model was generated using model building techniques supported by Rbrul[11] in the R statistical environment.[12]

RESULTS

Our subjects' survey responses are summarized in Table 2. The majority of our subjects (84%, $N = 66$) received an epidural during their current labor process. Approximately three quarters (73%, $N = 58$) of our subjects specified that they wanted an epidural before going into labor. A relative minority of subjects received oxytocin for their current labor process (43%, $N = 34$). More than half of the subject pool had previously received an epidural in a prior episode of labor (73%, $N = 58$).

There was very little variation in women's satisfaction ratings for their current labor processes. Furthermore, there was a clear ceiling effect whereby the vast majority of respondents rated their labor process as 9 or 10 of 10. The mean satisfaction was 9.32 ± 1.07.

Table 1. Survey instrument. Question wording is reproduced verbatim as read by the research team

Question	Answer options
Did you intend on having an epidural prior to onset of labor?	Yes, no, undecided
Did you receive an epidural as part of your labor and delivery process?	Yes, no, unsure
How many times do you recall being asked if you wanted an epidural?	0, 1–2, 3–5, >5
How long was your labor from time of arrival to Sparrow Hospital until birth?	
Was your labor induced or augmented with pitocin?	Yes, no, unsure
Rate the satisfaction of your labor delivery experience at [Hospital] on a scale of 1–10 (1 being extremely dissatisfied and 10 being extremely satisfied).	1–10
If you received an epidural rate the level of pain relief you received from it on a scale of 1–10 (1 being no relief at all and 10 being complete relief of pain).	1–10
Would you choose to have an epidural with a subsequent pregnancy?	Yes, no, unsure

Answer options were communicated to the patient, but not displayed visually.

Table 2. Counts and descriptive statistics for participant responses

Factor	Variants	$N_{subjects}$	Proportion	Mean	Standard deviation
Received epidural	Yes	66	0.84		
	No	13	0.16		
Prior epidural	Yes	58	0.73		
	No	21	0.27		
Wanted epidural	Yes	58	0.73		
	No	21	0.27		
Oxytocin received*	Yes	34	0.43		
	No	45	0.57		
Satisfaction	1–10			9.32	1.07
Hours in labor*	1–72			11.16	11.59
Frequency of queries	0–3			0.27	0.48

Factors marked with an asterisk (*) were not included in the multiple logistic regression model due to their skewed distribution with respect to other factors.

By contrast, hours of labor varied greatly from subject to subject. The mean was 11.16 ± 11.59 (median = 8.5). The skew in this parameter is due to a handful of labors lasting longer than 24 hours, notably including 48 and 72 hours labor durations.

Similarly, the frequency with which women were asked whether or not they wanted an epidural during their labor process exhibited substantial variability, with a mean of 0.27 ± 0.48 times per hour (median = 0.14 times per hour). Again, a few women experienced a much higher than average rate of queries.

Subdividing the data into women who received epidurals versus those who did not, additional trends emerge (Table 3 and Fig. 1). As demonstrated in Fig. 1, when compared to women who did not receive an epidural, a greater proportion of subjects who received an epidural had expressed a desire for an epidural in their birth plan. Other factors that may have contributed to whether or not an epidural was received include having had an epidural in a prior pregnancy, having more opportunities to receive an epidural in the current labor process, and administration of oxytocin to augment the present labor process (Table 3). With respect to prior epidural administration, most women who received an epidural in the current pregnancy also had one during a previous pregnancy (80%, $N = 53$). Focusing on the number of times women were offered an epidural during labor, the most substantive jump in receiving an epidural occurred between 0 and 1–2 queries. Sixty-three percent of subjects who were not specifically offered an epidural received one ($N = 7$). In contrast, greater than 85% of women who were asked 1–2, 3–5, or greater than five times received an epidural ($N = 37$ for 1–2 queries, $N = 16$ for 3–5, $N = 6$ for >5; see Fig. 2). Lastly, an overwhelming majority of the subjects who received oxytocin also received an epidural (99%, $N = 33$).

Table 3. Distribution of response counts with respect to subjects receiving or not receiving an epidural

Factor	Variants	Received epidural	No epidural
Prior epidural	Yes	53	5
	No	13	8
Times queried	0	7	4
	1 to 2	37	6
	3 to 5	16	2
	>5	6	1
Oxytocin received	Yes	33	1
	No	33	12

Epidural preference is excluded from this table as it is displayed in Fig. 1. Note that 'Times queried' as shown here is differentiated from 'Frequency of queries' (the rate of queries per hour in labor) reported in Table 2.

Wanting an epidural, frequency of epidural offers (as distinguished from number of offers), and overall satisfaction with labor were incorporated as predictors into a multiple logistic regression model of present epidural administration. Table 4 displays only those factors retained in the output of the Rbrul analysis as significantly predicting the distribution of epidural administration. Two significant predictors were retained in our model of receiving an epidural: desire for an epidural in the birth plan ($p < 0.01$) and frequency of epidural offers ($p < 0.01$). As predicted in Hypothesis 1, wanting an epidural was associated with receiving an epidural. Contrary to Hypothesis 2, however, frequency of queries negatively correlated with administration of an epidural. These results are summarized in Table 4 and illustrated in Fig. 2.

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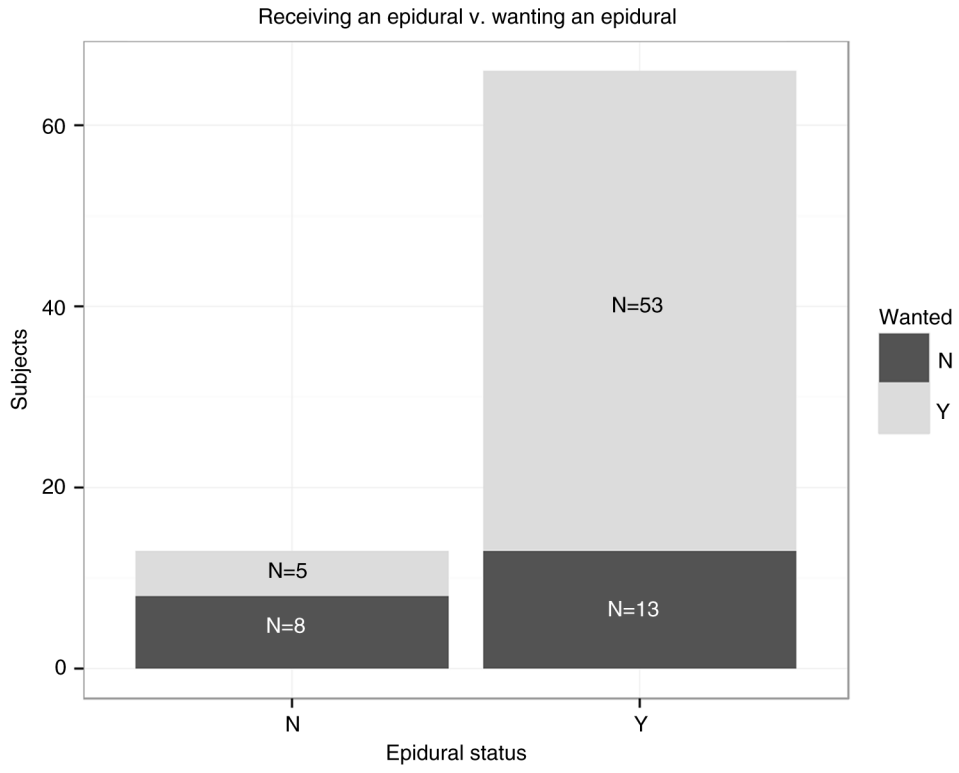

Figure 1. Women who received an epidural (Y) compared to those who did not receive an epidural (N) subdivided by those who wanted to receive an epidural (Y) compared to those who did not want to receive an epidural (N).

Figure 2. Frequency of epidural offers (times asked per hour) plotted against hours in labor. Women who received an epidural (Y) are distinguished from those who did not (N).

Table 4. Significant predictors of epidural administration

	Receiving an epidural (vs. not receiving an epidural)		
Grand mean 'receiving'	0.835		
Total *N*	79		
Deviance	52.246		
	Log odds	%	*N*
Wanting $p < 0.01$			
Yes	1.17	91.4	58
No	−1.17	61.9	21
Frequency $p < 0.01$			
Continuous	−1.87	N/A	N/A

Results are in the direction of receiving an epidural. Factors included in the analysis: wanting an epidural (wanting), frequency of epidural offers (frequency), and patient satisfaction.

DISCUSSION

Overall our findings suggest that women's preferences for epidural administration are major influences on whether or not they receive an epidural. This is particularly evident in the results of our regression analysis, which selected patient desire for an epidural as one of two significant predictors for epidural administration. Increasing frequency of provider epidural offers, the other significant factor in our model, actually had a negative predictive effect on epidural use. In other words, women who did not plan on having an epidural were less likely to receive one and, furthermore, multiple offers per hour decreased their likelihood of accepting an epidural. It may be the case that iterative offers reinforce women's desires to adhere to their original birth plans.

The dominant effect of patient preference in our model of epidural administration is consistent with prior literature indicating that women's opinions on epidural use are adequately expressed[5] and generally respected. Though reported rates of birth plan follow-through vary, our research corroborates previous suggestions that this variability is patient-mediated.[13] A qualitative study by Hidaka et al. following primigravid women into labor provides context for this observation.[14] They describe a transition from envisioning an ideal labor process to confronting the reality of extreme pain, beyond the expectations they had while constructing birth plans. Most of the women in this study elected to deviate from their initial intent of medication-free birth based on their own re-evaluation of the experience, yet remained satisfied with their labor processes.[14]

Satisfaction with the labor process in general did not predict whether or not an epidural was given. This is counterintuitive insomuch that prior studies reported an association between labor dissatisfaction and epidural use in women who did not want an epidural as part of their birth plans.[15] The high rate of satisfaction in our study suggests, however, that this apparent discrepancy may be a methodological artifact. As our study surveyed women with uncomplicated births in the immediate postpartum period, our satisfaction results may be less indicative of concordance between labor process and birth plan and more reflective of women's successful pregnancy outcomes. Hodnett's commentary on a meta-analysis of satisfaction with childbirth supports this possibility.[16] She notes that randomized control trials (RCTs) for pre- and peripartum interventions often fail to demonstrate the inverse relationship between medications/procedures and satisfaction shown in observational studies. She interprets this discrepancy as an effect of the necessary inclusion of complicated births in prospectively recruited RCTs, where said complications and their sequelae (e.g., prolonged labor, anxiety, and pain) mediate the relationship between intervention and satisfaction.[16]

Integrating across the variables considered here, our results generally emphasize a high degree of patient control exerted over epidural administration. Patients appear to be directing their analgesia experience both prior to and during the onset of labor. Whatever conflict may arise between patient and provider views on epidural use, they seem to be resolved in a way that is satisfactory to the patient and reflective of her desires, given that her opinion on pain control is subject to change as labor proceeds. Thus, current practice as observed in our study seems to be in accordance with published guidelines for management of pain relief during labor: 'decisions about interventions should incorporate the woman's personal values and preferences and should be made only after she has had enough information to make an informed choice, in partnership with her care team'.[17]

Though our study highlights the relative autonomy that women seem to enjoy in intrapartum epidural decision making, it has several key limitations that should be addressed in future work. Most importantly, our sample size was small and potentially underrepresentative of the population of laboring women in our setting of interest. Factors that may have proven significant in a larger study of epidural administration may not have been selected in our analysis due to our limited sample size. Furthermore, a variety of demographic and pregnancy-related variables were not collected in our survey. Age, marital status, socioeconomic

class, education level, etc. might have played a role in determining epidural use, but these factors were not recorded here (see Methods for a discussion of this issue). For example, Miller et al. explores the cultural aspect of a woman's preferences and how they compete with economic position and birth option availability, concluding that labor process is ultimately shaped by economic position and resource access.[4] Similarly, we did not survey any women with complicated pregnancies or stratify the labor processes of our surveyed women based on relative complexity (e.g., hours spent in labor, oxytocin administration). Though the later variables were recorded, they could not be modeled based on their distribution with respect to epidural use, suggesting that they might prove significant in a larger data pool where they might be included in statistical modeling processes. Hodnett's 2002 meta-analysis, discussed above, is consistent with this prediction.[16]

CONCLUSION

There are many ethical and practical concerns regarding laboring women's contribution to the epidural decision-making process. Our findings indicate that a woman's preference is the most influential factor in determining whether or not she receives an epidural for perinatal analgesia. Practitioners should be aware that the frequency of offers for an epidural has little or negative impact on a woman's acceptance of this intervention.

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