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Admission Process of Low Risk Women in Labour: Development of an Evidence-based Protocol

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Abstract

Introduction: To protect normal birth, admission of pregnant women in labour units is one of the most important decisions. This study developed a protocol for admission of women during labour in order to improve the accuracy of the diagnosis of onset of labour.

Methods: First the admission processes of 25 pregnant women were observed in the study hospital. Then the multi-disciplinary team searched and reviewed the Iranian database using related key words. Evidence-based medicine resources and other databases were searched using related key words for the most important symptoms in relation to the onset of active labour as well as early labour assessment programs.

Results: The results of observation of the admission process in the study hospital and review of the literature indicated that low-risk pregnant women in labour were admitted using different criteria. The evidence-based protocol for admission of women in labour was developed using these criteria to provide a guide, which lists the necessary measures in dealing with women in various situations during the onset of labour. Presence of regular uterine contractions, cervical dilatation ≥ 4 cm and effacement should be considered as signs of starting labour, which may be accompanied by spontaneous rupture of membranes or bloody show.

Conclusions: Protocols are appropriate clinical tools for the design and standardization of clinical processes based on the available evidence. This protocol could be used in a multi-center clinical trial to assess its effectiveness.

INTRODUCTION

The World Health Organization defines natural childbirth as a birth that has spontaneous onset of labour, is low risk at onset and remaining so throughout labour and childbirth [1]. The aim of maternity services is to admit women to the labour unit after the onset of active labour [2-4]. But evidence shows that many women are admitted to labour wards are later found not in labour [5-8]. This may result in many complications such as active phase disorders (arrest), oxytocin use, amniotomy, use of medications [9-17], amnionitis, epidural anesthesia [4, 18-21], postpartum hemorrhage [16, 22-28], and neonatal complications such as prematurity and neonatal infection [29, 30]. This may negatively affect maternal satisfaction with vaginal birth

[31, 32]. Additionally caesarean section (CS) rate has been increasing in developed countries and Iran over the last two decades significantly [33]. One potential explanation is over-diagnosis of dystocia which may relate to early admission in labour and using unnecessary interventions during labour and childbirth [13, 17, 34-36]. Therefore, the admission time of women in labour is one of the most important decisions to preserving natural birth [30]. However making a decision about "whether a woman is in active labour or not" is not easy for midwives and doctors in practice [11]. The diagnosis of the onset of labour is more problematic in a crowded environment with inadequate caregivers and limited resources, along with pressures from stressed women and their families who are not trained during prenatal care about the onset of labour. These complications may sometimes force the care providers to admit a woman in labour who isn't feeling any pain or only experiencing mild pain [37, 38]. In addition, when labour pain begins, many women, especially first time women are unsure whether their active phase of labour has started and are not confident to stay at home [39].

Care during labour and birth should be in compliance with evidence-based medicine. Therefore, implementing evidence-based interventions for promoting the quality of childbirth care is necessary [40, 41]. One of the best ways to promote the clinical processes is using a "protocol" or "clinical pathway" that is developed based on available evidence and helps to promote quality care and treatment. In fact, protocols are structured care plans that adapts the best available evidence to the local environment; specifies the stages of a care plan; and standardize the care for a clinical condition within a specific population [42]. Different studies have shown the effects of using clinical protocols on promotion of health care and treatment quality in different disciplines [43, 44]. Few previous studies have investigated the use of labour assessment programs with certain criteria for admission of women in labour. These studies reported lower interventions in labour [37, 45], lower CS rate [18], and a difference in woman's satisfaction of normal childbirth [45, 46]. The study conducted by Cheyne et al. (2008) used an algorithm to diagnose the active phase of labour, but due to limitations did not result in a reduction in oxytocin use, analgesia, duration of labour stages and change of birth method [37]. A Cochrane systematic review conducted by Lauzon and Hodnett (2009), evaluated the labour assessment programs for delaying the admission of women to labour wards. This review did not provide strong evidence about the effects of such programs on CS rate and maternal and perinatal consequences. Therefore, they called for new clinical trials in other centers in order to evaluate the risks and benefits of using labour assessment programs [23]. The Ministry of Health and Medical Education of Iran promotes normal childbirth and included the standards of evidence-based practice in the "National Guidelines for Normal Childbirth". However it only contains general points about the admission of women in labour [47]. In order to reduce the high rate of CS and complications related to early admission of low risk women in Iran and because of the lack of a detailed and practical guideline for admission of low risk women in labour, this study was conducted to develop an evidence-based clinical protocol for admission of women in labour. This paper reports the stages of the development of this protocol.

METHODS

This study was carried out from April to July of 2016. First, a multidisciplinary team of experts was gathered. The members of the team had great expertise in areas of admission to labour and normal birth. Then, after reviewing several related studies and investigating the process of admission at a hospital, the necessity to design a protocol for admission of women in labour was determined. Finally, through using evidence-based studies, the desired protocol was developed. This study has been approved by Shahid Beheshti University of Medical sciences and the study hospital and its code of ethical approval is SBMU3.REC.1394.160.

Organizing a Multidisciplinary Team

One of the most important steps in designing a protocol is to create a multidisciplinary team of professionals in different areas of expertise who are willing to work in a team. Therefore, a team of professionals, who were experts in natural childbirth process, was gathered. The team included two gynecologists, two faculty members of the midwifery school, and two midwifes from Shahid Beheshti University of Medical sciences.

Choosing Clinical Process

The first step of protocol development is the selection of a clinical process that may have a problem [48]. Therefore first the admission process of 25 women in labour was carefully observed. These women were first time women and admitted during the morning shift. Then the keywords such as "admission", "latent phase" and "delay" were used to search databases such as ProQuest, Scopus, Medline, Science Direct, and Google Scholar. Additionally these keywords in Persian were used to search Iran's national databases including SID, Magiran, Irandoc, and Iranian Registry of Clinical Trials for related studies. In addition, Up to Date website and Cochrane Collaboration were searched for clinical trials related to early admission in labour and related interventions. In the end, the multidisciplinary team reviewed existing literature in Iran and evidence-based resources, and developed a protocol for admission of women in labour.

RESULTS

The observations of the admission process of 25 women in the study hospital indicated that most women were

admitted in the latent phase. Only 10 of 25 admitted women were in active phase (cervical dilatation ≥4cm) and showed medium to severe uterine contractions. Other admitted women were in latent phase of labour (cervical dilatation < 4cm) of which six women had mild uterine contractions without water breaking or other signs of onset of labour, two women had mild pain with bloody show, and seven women showed no signs of going into labour and were admitted only because their due dates were close. Additionally, the review of different studies in Iran [9, 10, 14-16, 19, 25, 26, 29, 30] showed high rates of early admission in labour and its relation with increasing length of labour, duration of hospitalization as well as increasing complication rates which led to a need for more interventions for woman and newborn [5, 6, 14, 18, 19, 22, 49]. Also, dystocia was the most common current indication for primary CS, that it is characterized by abnormally slow progress of labour as a result of early admission to labour [25]. In order to develop this clinical protocol, first, the most recent studies about important signs of diagnosis of the onset of active phase of labour were reviewed. The review of these studies showed that there is no consensus about the definition of labour onset [20, 50-65]. Then, two clinical trials about designing an intervention for admission process in labour were investigated in detail. In the first trial, McNiven et al. (1998) evaluated the following factors in woman: fetal heart rate, duration and intensity of uterine contractions, and amniotic membrane. They would admit the woman only if cervical dilatation was ≥3cm and painful regular uterine contractions were present [45].

In the other trial, Cheyne et al. (2008) developed an algorithm for admission of women in labour. This algorithm recommends the following criteria: moderate pain related to regular uterine contractions (at least 3 contractions in 10 minutes), cervical dilatation ≥3cm along with cervical effacement, amnion sac rupture and bloody show [37].

Table 1: Previous Studies about using Assessment Programs in Labour

Researcher name and title of research	Research type
McNiven et al. (1998) **Title: An early labour assessment program: a randomized, controlled trial.**	Clinical trial conducted on 209 low-risk first time pregnant women. Intervention group: Assessment of duration and intensity of uterine contractions, checking amniotic membrane and bloody show. Admission in case of ≥3cm cervical dilatation or presence of dangerous and regular contractions. Control group: direct admission in labour
Cheyne et al. (2008) **Title: Effects of algorithm for diagnosis of active labour: cluster randomized trial**	Clinical trial conducted on 2320 low-risk first time pregnant women. Intervention group: using an algorithm and looking for the presence of key information such as painful (moderate to severe) and regular uterine contractions and at least one of the following signs: spontaneous rupture of membranes, bloody show, full cervical effacement and ≥3cm cervical dilatation. Control group: admission according to the clinical judgment of midwives.
Gross et al. (2009) **Title: Onset of labour: women's experiences and midwives' assessments in relation to first stage duration**	longitudinal cohort study on 1170 low-risk first time pregnant women in 41 birth center
Lauzon &Hodnett (2009) **Title: Labour assessment programs to delay admission to labour wards.**	Cochrane Review
Jackson and Gregory (2015) **Title: Management of the first stage of labour: potential strategies to lower the cesarean delivery rate**	Review study

1. Full term pregnancy (37-42 weeks) based on accurate date of last menstrual period or ultra sound performed between 8 to 16 weeks of pregnancy.
2. 18-35 years of age
3. First-time pregnant
4. Singleton pregnancy
5. cephalic fetal presentation
6. Normal BMI (19-25)
7. Absence of high risk pregnancy signs

Figure 1: Criteria for using Admission in Labour Protocol

The review of "National Guidelines for Normal Childbirth" showed that the instructions of the guideline of admission of women in the active phase but it did not include precise and detailed criteria [47]. Finally, by considering the most recent trials and studies about signs of active phase of labour [20, 37, 66], the protocols used in conducted clinical trials [20, 37, 45], the new findings in the study of Zhang et al. (2011) [67], and National Guidelines for normal childbirth [47], framework and contents of the new protocol (Fig 2). First demographic and obstetrics information of women is obtained. Then clinical assessments including blood pressure, pulse, and temperature measurement are performed. Prenatal care record is reviewed to ensure maternal and fetal health and accurate date of birth. In the next step, key information for diagnosing active phase of labour is obtained. Diagnosis of active phase of labour for admission of woman is based on existence of painful (moderate to severe) regular uterine contractions (2-5 contractions in 10 minutes, each contraction lasting 40-60 seconds), cervical dilatation of ≥4cm and cervical effacement, or either of the following signs: rupture of membranes or bloody show. According to this protocol, if these signs are not present, the woman should be supported emotionally and training about signs of going into labour, danger signs, and when to return to hospital should be given. These women will not be admitted to labour and will be sent home until their contractions get regular. If in some cases, woman's home is far from a hospital or experiencing severe stress, she should receive necessary care in a place in hospital which is designed for such situations.

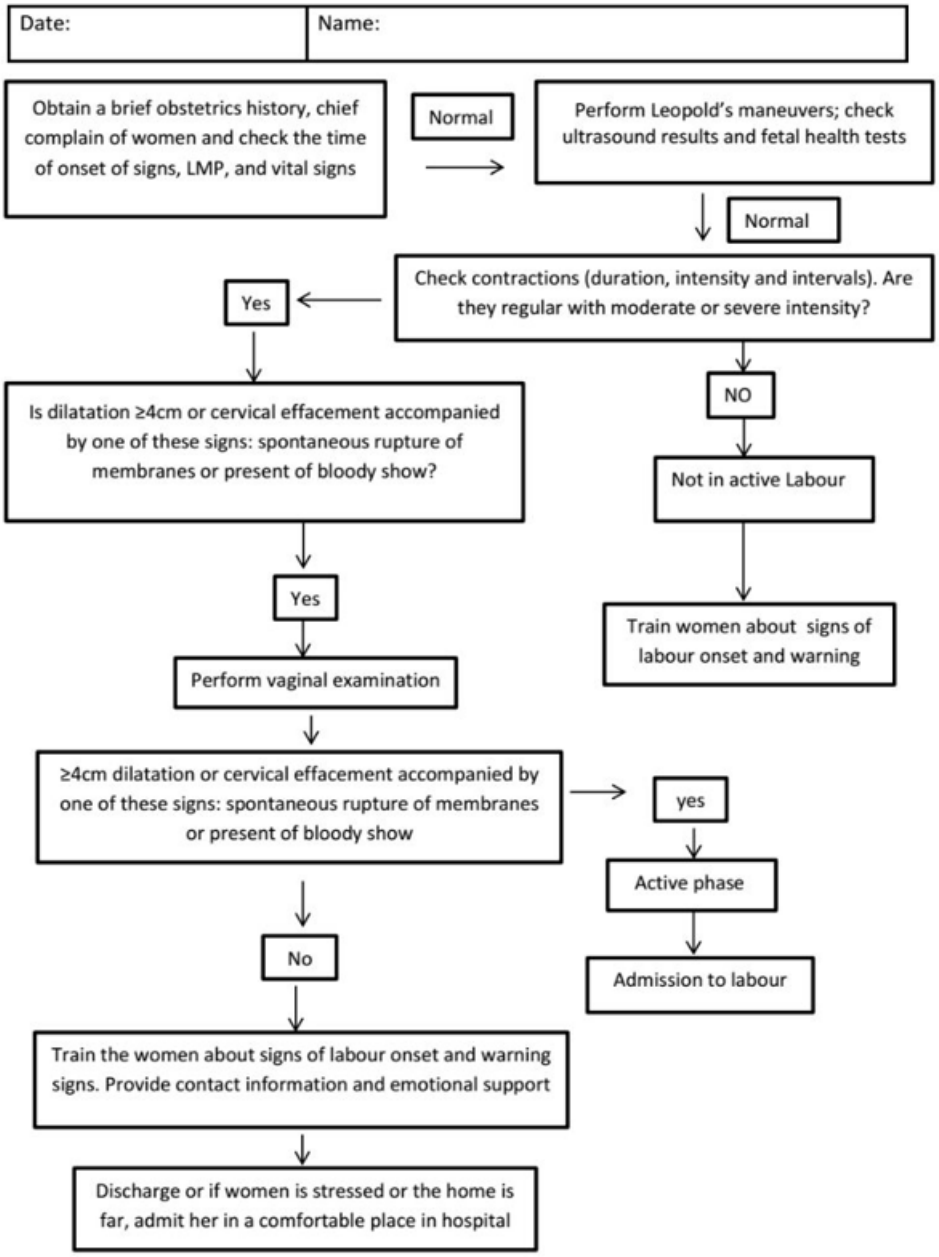

Figure 2: The Admission in Labour Protocol

DISCUSSION

This study developed an evidence-based clinical protocol for admitting low risk women in labour. Early admission in labour is common in Iran and is associated with increase of unnecessary interventions and CS rate. Also, investigating the process of admission of women in labour indicated that women in labour are admitted to the hospital with different criteria. These problems emphasized the need for developing an accurate clinical protocol for admission of women in labour. It should be noted that the diagnosis of labour is a complex interaction between woman and her family with midwife or physician. The central core of this judgment are the medical professionals (physician or midwife), who can guarantee the normal progress of labour or implement more interventions [11]. The most important issue in developing the protocol for admission in labour is to determine the definitive signs of labour and active phase. After reviewing the results of different studies and using the experience of the experts, we decided to specify a collection of signs for diagnosis of labour. In this study, the diagnosis of active phase for admission of woman was based on painful (moderate or severe) regular uterine contractions (3-5 contractions in 10 minutes, each contraction lasting 40-60 seconds), cervical dilatation of ≥4cm, cervical effacement with spontaneous rupture of membranes, or bloody show. Based on Friedman's definition, the onset of the latent phase of labour is when the woman experience regular uterine contractions. In most women, this stage ends when the dilatation reaches 3-5 centimeters. So, a cervical dilatation of 3-5 cm or more (≥3-5) along with uterine contractions could be a trustable indicator of active phase of labour [66]. Hunley et al. (2016) conducted a systematic review using 62 studies and mentioned the following signs for the onset of labour: cervical dilatation of ≥4cm, cervical effacement and uterine contractions. Little emphasis was given to other physiological signs such as bloody show. Also, in 30 percent of the studies, the onset of the active phase of labour was in dilatation of 3-4 cm, and in 45 percent of studies the beginning of the active phase was in dilatation of 4cm or more(≥4cm) [20]. However, Zhang et al. (2011) considered dilatation of ≥ 6cm as the onset of the active phase of labour and states that the labour progress would be faster than when it starts in 4 cm [67]. This contradicts with Friedman's findings (1997) who relate the onset of the active phase with lower dilatation rates [66]. Two studies, one conducted by McNiven et al. (1998) and the other by Cheyne et al. (2008), used specific key guidelines for diagnosing labour [37, 45] and Hunley et al. used a set of signs for diagnosis of labour [20].

One of the main issues regarding the development of this protocol was determining the intensity of uterine contractions. Sometimes the only measure for determining contraction intensity is women's experience of pain. The physician or midwife can check the quality and quantity of these contractions. They can determine the start of contractions by putting the palm of their hands on the uterus without any pressure. The intensity of contractions can be measured according to the level of stiffness of the uterus. When the effective contractions are at peak, the thumb finger or other fingers cannot enter the uterus easily which is a severe contraction. The next step is to determine when contractions stop. This sequence of examinations should be repeated in order to determine the intensity, duration, and number of contractions [66]. Also, latent phase starts when a woman feels regular contractions. This stage ends in cervical dilatation of 3-5 cm in most women. At this moment, the rate of cervical dilatation increases rapidly. Therefore, the dilatation of 3-5 cm or more along with uterine contractions can be considered as the onset of the active phase of labour [67, 68] Since 1980, tools such as evidence based guidelines and clinical pathways that help with decision making have spread around the world according to clinical governance standards, in order to promote the quality of care and patient's satisfaction [42, 69-72].

However, some care providers are not interested in implementing such tools. Also, some experts believe that labour is a unique experience and every woman's experience is different. Although the experience of labour is unique for every woman, there are also similarities that can lead to correct action [11].

Some believe using these tools might decrease clinical diagnosis ability but using protocols does not mean that the capability of providers of maternity services for taking care of women in labour has decreased [73]. It's true that protocols may have certain deficits, but at the same time, evidence indicates that using protocols for diagnosis, is better and more effective than sole clinical judgement. This study is based on the results of credible and evidence-based studies. Also, our study relied on a multidisciplinary team of experts in admission of labour. Nevertheless, using this protocol in in different settings may result in different outcomes. Therefore, using this protocol in clinical trials can enhance the protocol even further.

CONCLUSIONS

The diagnosis of labour onset is a difficult process. Therefore, introducing a reliable and efficient protocol for admission of women in labour which is based on different criteria is necessary and useful. Using this protocol for admission in labour helps providers evaluate the labour pain by woman and promotes the accuracy of the diagnosis. This protocol should be first tested in clinical trials and then, in action research in order to promote the quality of admission at the onset of active labour.

Ethical Consideration

This study was approved by the ethics committee of Shahid Beheshti University of Medical Sciences and the study hospital.

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Conflict of Interest

There was no conflict of interest to be declared.

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Author's Contributions

All authors contributed equally to the design of study and FA and FP drafted the article. All authors read and approved the final manuscript.

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