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Opinions of midwives and pregnant women on prelabour ultrasound examination

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Objectives: To survey the opinions of midwives and pregnant women on prelabour ultrasound examination.
Methods: Questionnaires on prelabour ultrasound examination were distributed to 40 midwives and 125 pregnant women in a regional hospital.
Results: 34 (85%) midwives and 125 (100%) pregnant women responded. Most midwives agreed or strongly agreed that prelabour ultrasound examination is acceptable with respect to workload (73.5%), enables labour ward beds to be utilised more efficiently (61.8%), should be encouraged for women not in labour (55.8%), and improves patient care (70.6%), and that most midwives are willing to learn and perform pre-labour ultrasound examination in future (85.3%). Subgroup analysis showed that the agree and non-agree groups did not differ significantly in terms of the number of prelabour ultrasound examination performed or years of labour ward experience. For pregnant women, 90.4% reported that it was their first ultrasound examination after admission for show or irregular contractions; 99.2% considered the study purpose clearly explained; 84.8% felt reassured that they were not yet in active labour after vaginal examination alone and 92.8% felt reassured with additional ultrasound examinations; 97.6% were satisfied with ultrasound examination and 95.2% would recommend it to others; and 72.8% reported no pain during ultrasound examination.
Conclusion: Most midwives support prelabour ultrasound examination and are willing to learn the technique. Prelabour ultrasound examination is well-tolerated by pregnant women. It should be introduced to midwives and pregnant women to improve intrapartum care.

Keywords: Midwifery; Patient satisfaction; Surveys and questionnaires; Ultrasonography

Introduction

The onset of labour is a diagnosis without a universally agreed definition[1,2]. It is a dilemma whether to admit women for early labour symptoms such as intermittent painful uterine contractions, as fast labour progress cannot be predicted[3]. Early hospital admission is associated with an increased risk of iatrogenic obstetric interventions including electronic fetal monitoring, epidural analgesia, augmentation, and Caesarean section[4-8]. It is unclear to women under what circumstances should they return to hospital again[9]. Therefore, providing information on labour progress may reduce the anxiety of women and their labour companions[10].

To assess labour progress, digital vaginal examination for cervical dilatation and length is traditionally used, but it is rather subjective and inaccurate, and uncomfortable to women[11,12]. Ultrasonography enables visualisation of fetal structures. Transperineal ultrasound can objectively assess fetal head position and station, with high inter- and intra-observer agreement[13-17]. The International Society of Ultrasound in Obstetrics and Gynaecology advocates the use of transperineal ultrasound in women with slow labour progress before instrumental delivery[18]. Transperineal ultrasound has been used to predict labour and delivery in situations of premature rupture of membranes at term[19], induction of labour[20], and first stage of labour[21] by measuring the head perineal distance, cervical length, fetal head position, and various maternal characteristics.

Since 2006, ultrasound examination has supplemented vaginal examination for labour examination on a case-by-case basis in our unit[22-26]. We studied 125 women from 2015 to 2017 to determine whether prelabour ultrasound examination could predict the time to delivery from the appearance of show or irregular contractions, using

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transabdominal scan for head position and transperineal scan for cervical length and head perineal distance[27-29]. The current study aimed to survey opinions of midwives and pregnant women on prelabour ultrasound examination.

Methods

This study was approved by the Kowloon West Cluster Research Ethics Committee (Reference: KW/FR-12-080 (86-15)). In January 2017, randomly coded questionnaires were distributed to midwives working in the labour ward and pregnant women who participated in the previous prelabour ultrasound study[30]. Consent was implied on returning the completed questionnaire.

Table 1. Demographics of midwives (n=34)

Variable	No. (%)
Age group, y	
20-29	9 (26.5)
30-39	12 (35.3)
40-49	12 (35.3)
≥50	1 (2.9)
Labour ward experience, y	
<1	8 (23.5)
1-5	4 (22.8)
6-10	9 (26.5)
>10	13 (38.2)
No. of prelabour ultrasound examinations performed	
0	8 (23.5)
1-5	3 (8.8)
6-10	5 (14.7)
>10	18 (52.9)

For the midwife questionnaire, there were three questions on demographics (age group, years of experience, and exposure of ultrasound examination) and five questions on their views and attitudes towards ultrasound examination. For the pregnant woman questionnaire, there were two questions asking whether this was their first ultrasound examination after the appearance of symptoms of labour, and whether the purpose of the study was clearly explained. In addition, there were five questions regarding whether they felt reassured with digital vaginal examination alone or with additional ultrasound examination, and whether they were satisfied with the ultrasound examination and would recommend it to others. They were then asked to give a pain score during prelabour ultrasound examination using a visual analogue scale of 0 to 10.

Statistical analysis was performed using SPSS (Windows version 22; IBM Corp, Armonk [NY], USA). The five responses were divided into agree (agree and strongly agree) and non-agree (neutral, disagree, and strongly disagree) groups. Subgroup analysis was performed to investigate the possible association between respondent characteristics and responses using Chi squared test or Fisher's exact test, as appropriate. A p value of <0.05 was considered statistically significant.

Results

Of 40 questionnaires distributed to midwives, 34 were returned (response rate, 85%). Most midwives agreed or strongly agreed that prelabour ultrasound examination is acceptable with respect to workload (73.5%), enables labour ward beds to be utilised more efficiently (61.8%), should be encouraged for women not in labour (55.8%), and improves patient care (70.6%), and that most midwives are willing to learn and perform pre-labour ultrasound

Table 2. Responses from midwives to questions on prelabour ultrasound examination (n=34)

Question	No. (%) of respondents				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Q1: Prelabour ultrasound examination is acceptable with respect to staff workload	0	0	9 (26.5)	22 (64.7)	3 (8.8)
Q2: Prelabour ultrasound examination enables labour ward beds to be utilised more efficiently	0	4 (11.8)	9 (26.5)	17 (50.0)	4 (11.8)
Q3: Prelabour ultrasound examination should be encouraged for women not in labour	0	3 (8.8)	12 (35.3)	18 (52.9)	1 (2.9)
Q4: I am willing to learn and perform prelabour ultrasound in future	0	0	5 (14.7)	25 (73.5)	4 (11.8)
Q5: Prelabour ultrasound examination improves patient care	0	2 (5.9)	8 (23.5)	20 (58.8)	4 (11.8)

examination in future (85.3%) [Table 2]. Subgroup analysis showed that the agree and non-agree groups did not differ significantly in terms of the number of prelabour ultrasound examination performed or years of labour ward experience (Table 3).

Of 125 questionnaires distributed to pregnant women, all were returned (response rate, 100%). 90.4% reported that it was their first ultrasound examination after admission for show or irregular contractions; 99.2% considered the study purpose clearly explained; 84.8% felt reassured that they were not yet in active labour after vaginal examination alone and 92.8% felt reassured with additional ultrasound examinations; 97.6% were satisfied with ultrasound examination and 95.2% would recommend it to others; and 72.8% of women reported no pain during ultrasound examination (Table 4).

Discussion

This is the first local survey on opinions of midwives and pregnant women view on prelabour ultrasound examination in the labour ward. The overall positive response from midwives and pregnant women was encouraging for wider use of prelabour ultrasound examination. Traditional digital vaginal examination is fundamental for midwifery but it is subjective[30]. If midwives can perform ultrasound examination in the labour ward, the additional information may supplement vaginal examination and hence improve labour assessment. In addition, pregnant women should be empowered to make their own decision as to whether to have intrapartum sonographic assessment and do not regard it as excessive.

The survey was designed in conjunction with the prelabour ultrasound study[30] because most midwives had enough experience in prelabour ultrasound examination. It is likely that midwives are also supportive of prelabour ultrasound examination in the labour ward because they are familiar with the preparation and techniques.

In a study of the view of midwives after a 1-hour training course with slideshows and supervised measurement, although 63.6% agreed intrapartum ultrasound was advantageous to patient care, 90.9%

Table 3. Subgroup analysis of opinions of midwives

	Question 1		Question 2		Question 3		Question 4		Question 5	
	No. of agree : non-agree	p Value	No. of agree : non-agree	p Value	No. of agree : non-agree	p Value	No. of agree : non-agree	p Value	No. of agree : non-agree	p Value
Overall (n=34)	25:9		21:13		19:15		29:5		24:10	
No. of prelabour ultrasound examination performed		0.87		0.13		0.13		0.47		0.51
0	6:2		3:5		3:5		6:2		4:4	
1-5	2:1		3:0		2:1		2:1		2:1	
6-10	3:2		2:3		4:1		5:0		4:1	
>10	14:4		13:5		10:8		16:2		14:4	
0 vs ≥1	6:2 vs 19:7	1.00	3:5 vs 18:8	0.21	3:5 vs 16:10	0.42	6:2 vs 23:3	0.57	4:4 vs 20:6	0.20
≤5 vs >5	8:3 vs 17:6	1.00	6:5 vs 15:8	0.71	5:6 vs 14:8	0.48	8:3 vs 21:2	0.30	6:5 vs 18:5	0.23
≤10 vs >10	11:5 vs 14:4	0.70	8:8 vs 13:5	0.29	7:5 vs 12:10	1.00	13:3 vs 16:2	0.65	10:6 vs 14:4	0.46
Labour ward experience, y		0.60		0.13		0.13		0.69		0.84
0	7:1		7:1		5:3		6:2		6:2	
1-5	3:1		3:1		2:2		4:0		3:1	
6-10	7:2		3:6		4:5		8:1		7:2	
> 10	8:5		8:5		8:5		11:2		8:5	
≤5 vs >5	10:2 vs 15:7	0.44	10:2 vs 11:11	0.07	7:5 vs 12:10	1.00	10:2 vs 19:3	1.00	9:3 vs 15:7	1.00
≤10 vs >10	17:4 vs 8:5	0.25	13:8 vs 8:5	1.00	11:10 vs 8:5	0.73	18:3 vs 11:2	1.00	16:5 vs 8:5	0.45

Table 4. Responses from pregnant women to questions on prelabour ultrasound examination (n=125)

Question	No. (%) of respondents				
	Yes		No		Not answered
Q1: In this pregnancy, is this your first time to have ultrasound examination after having symptoms of labour (bleeding/pain)?	113 (90.4)		11 (8.8)		1 (0.8)
Q2: Have healthcare workers clearly explained to you the purpose of the study?	124 (99.2)		0 (0)		1 (0.8)
	Strongly agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Q3: I feel reassured that I am not yet in labour after vaginal examination alone	39 (31.2)	67 (53.6)	16 (12.8)	2 (1.6)	1 (0.8)
Q4: I feel more reassured that I am not yet in labour with both vaginal and ultrasound examination, rather than vaginal examination alone	55 (44)	61 (48.8)	8 (6.4)	0 (0)	1 (0.8)
Q5: Overall, I am satisfied with prelabour ultrasound examination	61 (48.8)	61 (48.8)	2 (1.6)	0 (0)	1 (0.8)
Q6: I will recommend prelabour ultrasound examination to other mothers-to-be	60 (48)	59 (47.2)	5 (4)	0 (0)	1 (0.8)
Q7: Do you experience any pain during prelabour ultrasound examination (visual analogue scale of 0-10)?	score 0=91 (72.8); score 1=7 (5.6); score 2=19 (15.2); score 3=2 (1.6); score 4=4 (3.2); score 5-9=0 (0); score 10=1 (0.8); not answered=1 (0.8)				

preferred standard digital vaginal examination over ultrasound[31]. Therefore, structured practical training is important to build midwives' confidence to perform intrapartum ultrasound. From our subgroup analysis, midwives' acceptance and willingness to learn were not associated with years of experience or previous exposure to ultrasound examination.

Our survey did not aim to test the knowledge of midwives and did not include specific questions on knowledge. Currently, our institution provides a voluntary ultrasound training program in a labour ward that includes a 1-hour lecture and practical exercises with manikins[32], followed by a review of five ultrasound scans by the intrapartum team. Participants then perform 15 ultrasound examinations under the direct supervision of team doctors. Since 2017, eight midwives in our unit have been qualified and have performed intrapartum ultrasound scans to diagnose fetal head malposition so that alternative birthing posture may be adopted to enhance delivery progress[33].

Pregnant women were generally positive towards prelabour ultrasound examination. Most reported no pain during the examination, consistent with another study of intrapartum ultrasound[34]. Nonetheless, some women did not prefer prelabour ultrasound examination and reported discomfort as pressure was applied onto the perineum.

There were limitations to our study. The sample was small and involved only midwives working in the labour ward of a single centre and only pregnant women who participated in the prelabour ultrasound study; therefore the findings may not be representative of all midwives and pregnant women in Hong Kong. We aim to perform further surveys with more specific questions on intrapartum ultrasound examination after more midwives received such training and more pregnant women participated to determine which aspect of intrapartum ultrasound is most useful to midwifery practice and to identify potential barriers to its use.

Conclusion

Most midwives support prelabour ultrasound examination in the labour ward and are willing to learn the technique. Prelabour ultrasound examination is well tolerated by pregnant women. It should be introduced to midwives and pregnant women to improve intrapartum care.

Declaration

The authors have no conflict of interest to disclose.

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