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Experience and confidence in vaginal twin/breech delivery among trainees and junior specialists in Hong Kong public hospitals

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Objectives: To evaluate the perceived experience and confidence in providing vaginal twin delivery and vaginal breech delivery among obstetric trainees and junior specialists in Hong Kong, and to determine the correlations between the perceived experience and confidence and the numbers of vaginal twin/breech deliveries, forceps deliveries, and rotational operative deliveries performed.

Methods: An anonymous online questionnaire was developed to assess experience and confidence in vaginal twin/breech delivery among trainees and junior specialists in public hospitals. Respondents were asked about the numbers of vaginal twin/breech deliveries, forceps deliveries, and rotational operative deliveries performed. They were asked if they intended to offer vaginal twin/breech delivery in practice. Those who reported insufficient confidence in performing such deliveries were asked for their reasons.

Results: Of 141 eligible respondents, 58 (41.1%) responded. Of them, 52 (40 trainees and 12 junior specialists) were included for analysis. For vaginal twin delivery, the number of procedures performed was correlated with the perceived sufficient experience (r=0.612, p<0.01) and confidence (r=0.586, p<0.01). 12 (23%) respondents reported no sufficient confidence in performing vaginal twin delivery. Reasons provided were lack of training or experience (n=12) and concern about medical legal issues (n=5). 69.2% of respondents intended to offer vaginal twin delivery in practice; the percentage of those with confidence was not correlated with that of those with intention to offer it in practice (r=0.212, p=0.132). For vaginal breech delivery, the number of procedures performed was correlated with perceived sufficient experience (r=0.307, p=0.027) and confidence (r=0.659, p<0.01). 15 (29%) respondents reported no sufficient confidence in performing vaginal breech delivery. Reasons provided were lack of training and experience (n=14) and concern about medical legal issues (n=7). Only 25% of respondents intended to offer vagina breech delivery in practice; the percentage of those with confidence was not correlated with that of those with intention to offer it in practice (r=0.11, p=0.438).

Conclusion: Most respondents did not perceive themselves having sufficient experience and confidence in vaginal twin/breech delivery. The perceived sufficient experience and confidence in vaginal twin/breech delivery was positively correlated to actual clinical experiences. Training of vaginal twin/breech delivery should be provided before these techniques become obsolete.

Keywords: Breech presentation; Delivery, obstetric; Pregnancy, twin

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Introduction

Vaginal twin delivery and vaginal breech delivery are essential skills of obstetricians. According to the audit by the Hong Kong College of Obstetricians and Gynaecologists, the overall incidence of vaginal breech delivery was 0.2% over the 10-year period between 2004 and 2014, whereas the rate of spontaneous vaginal delivery of twin pregnancy declined from 0.5% in 2004 to 0.3% in 2014. Lack of clinical exposure by Hong Kong obstetricians may affect their performance of these procedures and willingness to offer them in daily practice.

For twin pregnancies reaching 32 weeks of gestation with cephalic presentation, there is no evidence to show that planned caesarean delivery is superior to planned vaginal delivery in terms of neonatal outcome[1]. The National Institute for Health and Care Excellence guideline suggests that planned vaginal delivery is a safe option for suitable candidates[2]. Although the Term Breech Trial reported that perinatal mortality and morbidity were significantly lower for planned caesarean delivery than vaginal birth[3], vaginal breech delivery remains a feasible option and should be offered in selected cases by those with expertise[4-7].

Forceps can be used to deliver the after-coming head in vaginal breech delivery, whereas ventose extraction and forceps can be used in delivering the second twin vaginally[8,9].

This study aims to evaluate the perceived experience and confidence in vaginal twin delivery and vaginal breech delivery among obstetric trainees and junior specialists in Hong Kong, and to determine the correlations between the perceived experience and confidence and the numbers of vaginal twin/breech deliveries, forceps deliveries, and rotational operative deliveries performed.

Methods

This study was approved by the Hong Kong East Cluster Research Ethics Committee (reference: HKECEREC-2021-046), Kowloon Central / Kowloon East Cluster Research Ethics Committee (reference: KC/KE-21-01-0146/ER-3), Kowloon West Cluster Research Ethics Committee (reference: KW/FR-21-029(156-11)), New Territories West Cluster Research Ethics Committee (reference: NTWC/REC/21041), Institutional Review Board of The University of Hong Kong / Hospital Authority Hong Kong West Cluster (reference: UW 21-394), and Joint Chinese University of Hong Kong – New Territories East Clinical Research Ethics Committee (reference: 2021.340).

Based on previous survey studies[10,11], an anonymous online questionnaire (Appendix) was developed to assess experience and confidence in vaginal twin/breech delivery among trainees and junior specialists (who attained fellowship within the past 5 years) in public hospitals. The questionnaire was refined after a pilot testing in five trainees who provided feedback on the questions and logistics of completing the questionnaire online. In September 2021, each trainee and junior specialist received an email via the Hospital Authority system, with a link to the online questionnaire. A reminder email was sent 3 weeks later. Respondents were asked about the numbers of vaginal twin/breech deliveries, forceps deliveries, and rotational operative deliveries performed. They were asked if they intended to offer vaginal twin/breech delivery in practice. Those who reported no sufficient confidence in performing such deliveries were asked for their reasons. Those who stated no interest in practising obstetrics in future were excluded from analysis.

Statistical analysis was performed using the SPSS (Macintosh version 28; IBM Corp, Armonk [NY], US). The Chi-squared test and Fisher exact test were used to compare differences between those perceived to have sufficient experience/confidence and those perceived to have not. The correlations between the perceived experience and confidence and the numbers of vaginal twin/breech deliveries, forceps deliveries, and rotational operative deliveries performed were assessed using the Spearman correlation analysis.

Results

Of 141 eligible respondents in Hong Kong public hospitals, 58 (41.1%) responded. Of them, six (10.3%) stated no interest in practising obstetrics and were excluded and the remaining 52 (40 trainees and 12 junior specialists) were included for analysis.

For vaginal twin delivery, more junior specialists than trainees perceived to have sufficient experience (91% vs 35%, $p<0.001$), but the percentage related to confidence was similar (91% vs 72.5%, $p=0.253$). The number of procedures performed was correlated with the perceived sufficient experience ($r=0.612$, $p<0.01$) and confidence ($r=0.586$, $p<0.01$) [Table 1]. In respondents who had performed <6 procedures, only 31% perceived to have sufficient experience. The percentage increased to 92% in those who had performed >10 procedures. In those who had performed <6 procedures, 56% and 14% perceived to be confident with and without supervision, respectively. The percentage increased to 100% and 69%,

Table 1. Perceived sufficient experience and confidence of trainees and junior specialists in relation to the number of vaginal twin/breech deliveries performed

Perceived sufficient experience and confidence	No. of vaginal twin/breech deliveries performed*			Spearman's coefficient	p Value
	0-5	6-10	>10		
Perceived sufficient experience					
Vaginal breech delivery				0.307	0.027
Yes (n=15)	7 (19)	2 (40)	6 (60)		
No (n=37)	30 (71)	3 (60)	4 (40)		
Vaginal twin delivery				0.612	<0.01
Yes (n=25)	11 (31)	2 (50)	12 (92)		
No (n=27)	24 (69)	2 (50)	1 (8)		
Perceived sufficient confidence					
Vaginal breech delivery				0.659	<0.01
Yes without supervision (n=10)	1 (3)	1 (17)	8 (89)		
Yes with supervision (n=27)	23 (62)	3 (50)	1 (11)		
No (n=15)	13 (35)	2 (33)	0		
Vaginal twin delivery				0.586	<0.01
Yes without supervision (n=15)	5 (14)	1 (33)	9 (69)		
Yes with supervision (n=25)	20 (56)	1 (33)	4 (31)		
No (n=12)	11 (30)	1 (33)	0		

* Data are presented as No. (%) of respondents

respectively, in those who had performed >10 procedures. 12 (23%) respondents reported no sufficient confidence in performing vaginal twin delivery. Reasons provided were lack of training or experience (n=12) and concern about medical legal issues (n=5). They suggested that supervision (n=12) and simulation training (n=7) could improve their confidence. 26 respondents reported to have experienced, witnessed, or learned about adverse events of vaginal twin delivery; the most common was failed vaginal delivery requiring caesarean section (n=23) followed by primary postpartum haemorrhage (n=18). 69.2% of respondents intended to offer vaginal twin delivery in practice; the percentage of those with confidence was not correlated with that of those with intention to offer it in practice (r=0.212, p=0.132).

For vaginal breech delivery, more (but not significantly) junior specialists than trainees perceived to have sufficient experience (50% vs 22.5%, p=0.81) and confidence (91% vs 64%, p=0.143). The number of procedures performed was correlated with perceived sufficient experience (r=0.307, p=0.027) and confidence (r=0.659, p<0.01) [Table 1]. The percentage of respondents who perceived to have sufficient experience increased from 19% in those with <6 procedures to 60% in those with >10 procedures. In those with <6 procedures, only 3% perceived to be confident to perform vaginal breech delivery without supervision. The percentage increased to 89% in those with >10 procedures. 15 (29%) respondents reported no sufficient confidence in performing vaginal breech delivery. Reasons provided were lack of training and experience (n=14) and concern about medical legal issues (n=7). They suggested that supervision (n=14) and simulation training (n=9) could improve their confidence. 19 respondents reported to have experienced, witnessed, or learned about adverse events of vaginal breech delivery; the most common was entrapment of after coming head (n=16) followed by birth asphyxia (n=9). Only 25% of respondents intended to offer vagina breech delivery in practice; the percentage of those with confidence was not correlated with that of those with intention to offer it in practice (r=0.11, p=0.438).

Perceived sufficient experience and confidence in vaginal twin delivery and vaginal breech delivery were all correlated with the number of forceps deliveries performed (Table 2) and the number of rotational operative deliveries performed (Table 3).

Discussion

Vaginal twin delivery and vaginal breech delivery are essential skills in obstetrics but have fallen out of favour

Table 2. Perceived sufficient experience and confidence of trainees and junior specialists in relation to the number of forceps deliveries performed

Perceived sufficient experience and confidence	No. of forceps deliveries performed*							Spearman's coefficient	P Value
	0	1-10	11-20	21-30	31-40	41-50	>50		
Received sufficient experience									
Vaginal breech delivery								0.302	0.029
Yes (n=15)	1 (11)	3 (17)	2 (33)	4 (57)	3 (43)	0	2 (40)		
No (n=37)	8 (89)	15 (83)	4 (67)	3 (43)	4 (57)	0	3 (60)		
Vaginal twin delivery								0.364	<0.01
Yes (n=25)	1 (11)	9 (50)	2 (33)	4 (57)	5 (71)	0	4 (80)		
No (n=27)	8 (89)	9 (50)	4 (67)	3 (43)	2 (29)	0	1 (20)		
Perceived sufficient confidence									
Vaginal breech delivery								0.620	<0.01
Yes without supervision (n=10)	0	0	1 (17)	3 (43)	4 (57)	0	2 (40)		
Yes with supervision (n=27)	1 (11)	14 (78)	4 (66)	3 (43)	2 (29)	0	3 (60)		
No (n=15)	8 (89)	4 (22)	1 (17)	1 (14)	1 (14)	0	0		
Vaginal twin delivery								0.514	<0.01
Yes without supervision (n=15)	0	2 (11)	2 (33)	3 (43)	4 (57)	0	4 (80)		
Yes with supervision (n=25)	3 (33)	14 (78)	3 (50)	3 (43)	2 (29)	0	0		
No (n=12)	6 (67)	2 (11)	1 (17)	1 (14)	1 (14)	0	1 (20)		

* Data are presented as No. (%) of respondents

in recent year. This renders obstetric trainees lacking such clinical experience. There is a paradigm shift from vaginal to caesarean delivery for breech presentation since the Term Breech Trial in 2000[12].

For vaginal twin delivery, cephalic/breech presentation should not be the contraindication. There is about 20% chance for the second twin to change the presentation[13]. Vaginal breech extraction and internal podalic version for the second twin is the key technique to achieve successful and safe vaginal twin delivery[14]. These techniques can be learned indirectly during caesarean section. For vaginal breech delivery, techniques such as the Løvset or Bickenbach manoeuvres (to reduce nuchal arms) and the Mauriceau-Smellie-Veit manoeuvre or Piper forceps (to deliver the after-coming head) can also be learned during caesarean section[15].

Most trainees perceived themselves lacking experience in both procedures, whereas half of junior specialists perceived themselves lacking experienced in vaginal breech delivery. Junior specialists were not more likely than trainees to be confident in both procedures. 69.2% of respondents intended to offer vaginal twin delivery in practice, whereas only 25% of respondents intended to offer vagina breech delivery in practice. This finding is consistent with the 87.3% and 32.7%, respectively, reported in trainees and new specialists in Australia and New Zealnd[10].

The numbers of forceps deliveries and rotational operative deliveries performed were correlated with the perceived sufficient experience and confidence in vaginal twin/breech delivery. Some skills in vaginal twin/breech delivery overlap those in forceps/rotational operative deliveries. Experience in these complex techniques may indirectly boost respondent confidence in practising vaginal twin/breech delivery.

In Hong Kong, all obstetricians receive training in public hospitals. With an increasing rate of caesarean section worldwide[16], techniques of vaginal twin/breech delivery may be less practised. Trainers have less hands-on experience as well[17]. Thus, the Hong Kong College of Obstetricians and Gynaecologists should review up-to-date evidence on vaginal twin/breech delivery and provide guidance for frontline obstetricians on counselling. Education to public should be provided to clear

Table 3. Perceived sufficient experience and confidence of trainees and junior specialists in relation to the number of rotational operative deliveries performed

Perceived sufficient experience and confidence	No. of rotational operative deliveries performed*							Spearman's coefficient	p Value
	0	1-10	11-20	21-30	31-40	41-50	>50		
Received sufficient experience									
Vaginal breech delivery								0.330	0.017
Yes (n=15)	0	4 (25)	1 (20)	3 (50)	2 (50)	3 (100)	2 (25)		
No (n=37)	10 (100)	12 (75)	4 (80)	3 (50)	2 (50)	0	6 (75)		
Vaginal twin delivery								0.351	0.011
Yes (n=25)	4 (40)	4 (25)	1 (20)	5 (83)	2 (50)	3 (100)	6 (75)		
No (n=27)	6 (60)	12 (25)	4 (80)	1 (17)	2 (50)	0	2 (25)		
Perceived sufficient confidence									
Vaginal breech delivery								0.609	<0.01
Yes without supervision (n=10)	0	1 (6)	0	3 (50)	1 (25)	2 (67)	3 (38)		
Yes with supervision (n=27)	3 (30)	8 (50)	5 (100)	3 (50)	2 (50)	1 (33)	5 (62)		
No (n=15)	7 (70)	7 (46)	0	0	1 (25)	0	0		
Vaginal twin delivery								0.619	<0.01
Yes without supervision (n=15)	0	1 (6)	0	5 (83)	1 (25)	2 (67)	6 (75)		
Yes with supervision (n=25)	6 (60)	8 (50)	5 (100)	1 (17)	2 (50)	1 (33)	2 (25)		
No (n=12)	4 (40)	7 (44)	0	0	1 (25)	0	0		

* Data are presented as No. (%) of respondents

misconception towards these procedures. Careful selection of suitable patients for counselling on vaginal twin/breech delivery may enable trainers and trainees to gain experience in teaching and learning. Regular simulation training should be provided to maintain proficiency of skills so as to improve patient outcomes, quality, and safety[18].

The perceived confidence was not correlated with intention to offer vaginal twin/breech delivery. Medico-legal consideration plays a role in the decision-making process of clinical practice[19]. In addition to adequate training and practice, medicolegal support should be provided to obstetricians to encourage them to offer vaginal twin/breech delivery to suitable patients. Private obstetricians have additional concerns about insurance.

There are limitations to the present study. The nature of questionnaire survey has a built-in recall bias. The response rate is low (41.1%), which is similar to the 31.7% to 65% reported in other studies[10,11]. Web-based survey is prone to low response rate[20]. The long questionnaire may further reduce the incentive to complete the questionnaire. To improve the response rate, using shorter questionnaire, offering incentives, and providing mail options can be considered[21]. The rates of vaginal deliveries and caesarean sections of twin and breech pregnancies in the respondents' units are associated with the individual respondents' practice[22]. The level of confidence was not measured objectively.

Conclusion

Most respondents did not perceive themselves having sufficient experience and confidence in vaginal twin/breech delivery. The perceived sufficient experience and confidence in vaginal twin/breech delivery was positively correlated to actual clinical experiences. Training of vaginal twin/breech delivery should be provided before these techniques become obsolete.

Contributors

All authors designed the study, acquired the data, analysed the data, drafted the manuscript, and critically revised the manuscript for important intellectual content. All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Data availability

All data generated or analysed during the present study are available from the corresponding author on reasonable request.

Ethics approval

This study was approved by the Hong Kong East Cluster Research Ethics Committee (reference: HKECEREC-2021-046), Kowloon Central / Kowloon East Cluster Research Ethics Committee (reference: KC/KE-21-01-0146/ER-3), Kowloon West Cluster Research Ethics Committee (reference: KW/FR-21-029(156-11)), New Territories West Cluster Research Ethics Committee (reference: NTWC/REC/21041), Institutional Review Board of The University of Hong Kong / Hospital Authority Hong Kong West Cluster (reference: UW 21-394), and Joint Chinese University of Hong Kong – New Territories East Clinical Research Ethics Committee (reference: 2021.340).

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Appendix. Questionnaire

Demographics

1. What is your level of training?
   - Basic trainee
   - Higher trainee
   - Junior specialists (year 1-5 post fellowship)
2. If you are a trainee, which level of professional examinations have you already achieved?
   - MRCOG part 1
   - SOE
   - MRCOG part 2
   - MRCOG part 3
3. If you are a specialist, what is your current career pathway?
   - Not related to maternal-fetal medicine (MFM)
   - MFM trainee
   - MFM sub-specialist
4. What is your gender?
   - Male
   - Female
5. What is your age group (years)?
   - 18-24
   - 25-34
   - 35-44
   - ≥45
6. Do you intend to practise obstetrics in your future career as specialist?
   - Yes
   - No
   - Not sure

Vaginal breech delivery

7. How many singleton vaginal breech deliveries have you conducted?

Live birth	IUD
• None	• None
• 1	• 1
• 2	• 2
• 3	• 3
• 4	• 4
• 5	• 5
• 6	• 6
• 7	• 7
• 8	• 8
• 9	• 9
• 10	• 10
• >10	• >10

8. Have your ever personally experienced, witnessed, or learned about any adverse event during vaginal breech delivery?
   - Yes
   - No

   If your answer to question 8 is "No", please go to question 11.
9. What is/are the type of adverse event(s)?
   - Cord prolapse
   - Birth asphyxia
   - Entrapment of after coming head
   - Birth trauma
   - Failed vaginal breech delivery requiring caesarean section
   - Major genital trauma
   - Primary postpartum haemorrhage
   - Others: _____
10. Your personal experience with adverse event(s) during virginal delivery. (Can choose multiple options as appropriate.)
    - I experienced it myself.
    - I witnessed it.
    - I learned about it.
11. Do you feel you have received sufficient experience to perform vaginal breech deliveries?
    - Yes
    - No
12. Do you feel confident in performing vaginal breech deliveries?
    - Yes (Unsupervised)
    - Yes (Supervised with a senior present)
    - No

    If your answer is "Yes" to question 12, please go to question 15
13. What is the reason making you feel not confident enough in performing vaginal breech delivery?
    - Lack of training or experience
    - Lack of support from senior obstetrician
    - Lack of support from other specialties such as anaesthesiologists/paediatricians
    - Worry about medico-legal consequences in case of complications
    - Others: _____
14. What would make you feel more confident in offering vaginal breech delivery?
    - Simulation training
    - Lectures
    - Performing vaginal breech deliveries under supervision
    - Adequate support from other specialties
    - Adequate medico-legal support
    - Others: _____
15. Do you intend to offer vaginal breech delivery in your practice?
    - Yes
    - No
    - Not sure

Appendix. (cont'd)

Vaginal twin delivery

16. How many vaginal twin deliveries have you conducted?

Live birth	IUD in one twin or both twins
• None	• None
• 1	• 1
• 2	• 2
• 3	• 3
• 4	• 4
• 5	• 5
• 6	• 6
• 7	• 7
• 8	• 8
• 9	• 9
• 10	• 10
• >10	• >10

17. Have your ever personally experienced, witnessed, or learned about any adverse event during vaginal twin delivery?
    - Yes
    - No

    If your answer is "No" to question 17, please go to question 20
18. What is/are the type of adverse event(s)?
    - Cord prolapse
    - Birth asphyxia
    - Entrapment of after coming head
    - Birth trauma
    - Failed vaginal twin delivery requiring caesarean section
    - Major genital trauma
    - Primary postpartum haemorrhage
    - Others: _____
19. Your personal experience with adverse event(s) during virginal delivery. (Can choose multiple options as appropriate.)
    - I experienced it myself.
    - I witnessed it.
    - I learned about it.
20. Do you feel you have received sufficient experience to perform vaginal twin delivery?
    - Yes
    - No
21. Do you feel confident in performing vaginal twin delivery?
    - Yes (Unsupervised)
    - Yes (Supervised with a senior present)
    - No

    If your answer is yes to question 21, please go to question 24
22. What is the reason making you feel not confident enough in performing vaginal twin delivery?
    - Lack of training or experience
    - Lack of support from senior obstetrician
    - Lack of support from other specialties such as anaesthesiologists/paediatricians
    - Worry about medico-legal consequences in case of complications
    - Others: _____
23. What would make you feel more confident in offering vaginal twin delivery?
    - Simulation training
    - Lectures
    - Performing vaginal twin deliveries under supervision
    - Adequate support from other specialties
    - Adequate medico-legal support
    - Others: _____
24. Do you intend to offer vaginal twin delivery in your practice?
    - Yes
    - No
    - Not sure

Complex vaginal delivery

25. How many forceps deliveries have you performed?
    - None
    - 1-10
    - 11-20
    - 21-30
    - 31-40
    - 41-50
    - >50
26. How many rotational operative deliveries have your performed?
    - None
    - 1-10
    - 11-20
    - 21-30
    - 31-40
    - 41-50
    - >50
27. Do you feel confident in performing forceps delivery?
    - Yes
    - No
28. Do you feel confident in performing rotational operative delivery?
    - Yes
    - No
29. Any other comments:

    _____