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Original Article

A questionnaire study on the acceptability of self-sampling versus screening by clinicians for Group B *Streptococcus*

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Abstract

Background: Group B *Streptococcus* (GBS) is a leading cause of neonatal morbidity and mortality. In an effort to reduce the impact of this serious affliction, universal screening for GBS has been adopted in many countries. The objective of this study was to examine the acceptability of self-collected GBS swabs in a local population in Hong Kong.

Methods: This study is a cross-sectional questionnaire survey conducted in a tertiary teaching hospital. A total of 327 pregnant women who attended the antenatal clinic for GBS screening from April 2012 to May 2012 were included in our study. The acceptability of GBS self-screening and its associated factors were analyzed.

Results: Of these women, 200/320 (62.5%) participants preferred screening by healthcare workers, whereas only 18/320 (5.6%) preferred self-screening. The most common reasons why some participants preferred to be screened by clinicians were that professionals had greater knowledge, and the added worry about the accuracy of self-screening. 22/320 (69.4%) and 195/320 (60.9%) women believed that they felt comfortable enough to self-perform the vaginal swab and rectal swab respectively. Previous use of tampons was associated with higher perceived capability of self-performing the vaginal swab. Perceived capability to self-perform the rectovaginal swabs was associated with a willingness to self-perform the swabs ($p < 0.001$). The majority of women, 303/320 (94.7%), found the current practice of an additional clinic visit for GBS screening acceptable. However, 218/320 (68.1%) participants would like to undertake self-screening if they were given the chance to do so in the next pregnancy, and 187/320 (58.4%) would recommend others have self-screening for GBS as well.

Conclusion: Most women in the local population still preferred physician-collected samples for GBS screening, but they welcomed the option of self-screening in future pregnancies. Improved health education about the importance of GBS screening may improve the willingness of women to perform self-screening.

Keywords: Group B *Streptococcus*; patient preference; screening

1. Introduction

Group B *Streptococcus* (GBS) is a leading infectious cause of neonatal morbidity and mortality.[1] GBS colonization in the maternal gastrointestinal and genital tracts has been found in 10–30% of pregnancies, with vertical transmission being implicated in early-onset GBS infection in the newborn.[2] Since universal screening for GBS was first recommended by the American College of Obstetricians and Gynecologists and the Centre for Disease Control and Prevention in 2002,[3] the incidence of early-onset GBS has been reduced by 27% in the United States.[4] Universal screening for rectovaginal GBS colonization at 35–37 weeks is now recommended by various guidelines from the United States,[5] Canada,[6] Australia, and New Zealand[7] to reduce the morbidity and

Conflicts of interest: The authors declare that they have no conflicts of interest related to the subject matter or materials discussed in this article.

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mortality of neonates due to early-onset GBS infection. In Hong Kong, 10% of pregnant women are GBS carriers.[8] A universal screening program for GBS for all pregnant women who attend the Hospital Authority's obstetrics clinics or Department of Health's Maternal and Child Health Centers between 35–37 weeks' gestation was launched in January 2012, and intrapartum antibiotics prophylaxis is now given to screen-positive women.

There is normally no obstetric indication to perform a vaginal examination outside the scope of GBS screening at 35–37 weeks. In an ideal situation, GBS screening should be performed during antenatal follow up in the last month of pregnancy, although it is performed as a separate session in our unit owing to logistics reasons and busy antenatal clinics. Universal screening would mean a loss of privacy for the patient and additional costs in terms of clinic sessions and professional expertise in collecting and processing the swabs. Various studies have shown that patient-collected swabs are at least as sensitive as those taken by physicians.[9–13] These studies were mainly conducted in western countries, where self-sampling is common and has been accepted, as is the case with self-sampling of vaginal secretions for chlamydia. The adoption of self-screening would depend on the acceptability of women for self-sampling. If cultural practices do not support self-sampling of rectovaginal swabs, women may find it difficult and this may even affect the accuracy of the taken swabs.

There have not been any studies to date comparing the acceptability and accuracy of self-collected swabs with clinician-taken swabs in a local population. Although previous studies suggest that patient-collected swabs are at least as sensitive as physician-taken swabs, a conservative attitude of the Chinese culture on self-examination may affect the efficacy of the screening program. However, if self-screening for GBS is widely acceptable, its implementation can potentially lead to cost savings. The purpose of the present study is to examine the acceptability of self-collected GBS swabs in a local population.

2. Methods

This study was based upon a questionnaire involving pregnant women attending the antenatal clinic at a tertiary teaching hospital in Hong Kong for GBS screening. The actual GBS screening was performed as a separate clinic session at 35–37 weeks' gestation in our unit, and the study was conducted from April 2012 to May, 2012. Approval by the local Institutional Review Board was obtained, and all participants gave written informed consent. All women who attended the clinic for GBS screening and were aged > 18 years were recruited. The exclusion criteria for this study included: (1) those with GBS in the midstream urine found at any point during the pregnancy prior to inclusion into the study; (2) a history of affected baby such that screening for GBS was not necessary; or (3) women who could not understand English or Chinese.

All women who attended the clinic session were given a visual presentation and an information sheet regarding neonatal GBS infections and GBS screening, including a diagram illustrating the relevant anatomy for self-sampling. A nurse was also available to answer questions from the participants. Upon their arrival at the clinic, the participants were given a questionnaire to complete (Fig. 1), and were asked to return the questionnaire to the nurse after GBS screening swabs were taken. The questionnaire included demographic information, their preference, and acceptability of self-sampling.

The sample size was calculated based on a 95% confidence level. One previous study had shown that 28% of women preferred to perform their own swab, whereas 43% preferred their physician to perform the swab.[11] A sample size of 212 will have a power of 0.9 at 5% significance level to detect such difference in preference.

In this study, the data was analyzed using SPSS (version 20; IBM Corporation, New York, USA). The women's preferences were expressed in percentages, and the Chi-square test and the Mann-Whitney test were used to examine the factors associated with their perceived capability to perform self-GBS screening. A p value < 0.05 was considered statistically significant.

The primary outcome of this study was the acceptability of self-collected swabs for GBS screening compared with clinician-collected swabs.

3. Results

A total of 327 women completed the questionnaire. Of that number, seven were excluded due to substantial missing data from the questionnaire (>50% missing values). The mean age of the participants was 32.1 ± 4.7 years, and the median gestational age was 35 weeks. The level of education and occupation of the women who participated in the study are shown in Table 1.

There were 200/320 (62.5%) participants who preferred screening by healthcare workers, whereas 102/320 (31.9%) had no preference, and only 18/320 (5.6%) preferred self-screening. The reasons for their preference are summarized in Tables 2 and 3.

We also found that 222/320 (69.4%) and 195/320 (60.9%) women believed that they were comfortable enough to self-perform the vaginal swab and rectal swab respectively. Previous use of tampons was associated with higher perceived capability of self-performing the vaginal swab (Table 4). None of the examined factors was associated with the perceived capability of self-performing the rectal swab (Table 5). Perceived capability to self-perform the vaginal and rectal swabs was associated with a willingness to self-perform the swabs ($p < 0.001$; Table 6).

The majority of women (303/320, 94.7%) found the current practice of an additional clinic visit for GBS screening acceptable. Nevertheless, 218/320 (68.1%) participants would like to undertake self-screening if they were given the chance to do so in the next pregnancy, and 187/320 (58.4%) would recommend others to have self-screening for GBS.

Study Title: A questionnaire study on the acceptability of self sampling versus screening by clinician for Group B streptococcus

Part 1 – background information

1. Age: _____
2. Current gestation: _____
3. Occupation: _____
4. Education level: Primary Secondary Tertiary and above
5. Religion: No Yes, please specify _____
6. No. of pregnancies in the past: 0 1 2 3 >3
7. Do you smoke? Yes No
8. Do you drink alcohol? Yes No
9. Do you have history of GBS affected baby? Yes No

Part 2 – preference and acceptability of self sampling

1. Have you had any cervical smear before? Yes No
   If yes, how many times have you had such screening? 1 2 3 >3

2. Have you ever used any vaginal suppositories e.g. for candida infection?
   Yes No
   If yes, how many times? 1 2 3 >3

3. Have you used tampons before? Yes No
   If yes, how many times? 1 2 3 >3

4. Have you used an intrauterine device for contraception before? Yes No
   If yes, have you ever performed self checking of the IUCD thread? Yes No

5. Have you heard of GBS infection in the past? Yes No

6. Have you had rectovaginal swab taken for GBS screening in the past?
   Yes No

7. Do you feel that the current practice (i.e. an extra visit to the clinic just for GBS sampling) is acceptable? Yes No

8. If you were given a choice to perform the rectovaginal swab yourself, do you feel comfortable in doing it after being given information on it?
   Yes No

9. Will you prefer the swab to be taken by the doctor?
   Yes No No preference

If Yes, why:

- Professional had greater knowledge
- Worry about accuracy of result
- Difficult to perform self sampling
- Dislike the self-test
- Others: (please state)

If No, why:

- More Privacy
- No need for extra clinic visit
- Greater physical comfort
- Easy to perform
- Desire for knowledge about own body
- Desire for knowledge about performing the test
- Others: (please state)

10. Will you want to have self-screening in your next pregnancy if you were given a chance to do so? Yes No

11. Would you recommend others to have self GBS screening? Yes No

12. Any other comments:

End of this questionnaire

Fig. 1. Participant questionnaire. GBS = Group B *Streptococcus*; IUCD = intrauterine contraceptive device.

Table 1
Occupation and education level of participants.

		No. of participants	%
Occupation	Housewife	55/274	20.1
	Manual worker	4/274	1.4
	Professional	42/274	15.3
	Sedentary work	146/274	53.3
	Unemployed	24/274	8.8
	Others	3/274	1.1
Education	Primary	5/312	1.6
	Secondary	124/312	39.7
	Tertiary	183/312	58.7

Table 2
Reasons for preferring clinician collection of swabs.

Reason	No. of participants	%
Professionals have greater knowledge	121/200	60.5
Worry about the accuracy of results	113/200	56.5
Difficult to perform self-sampling	57/200	28.5
Dislike the self-test	11/200	5.5
Others	1/200	0.5

Table 3
Reasons for preferring self-collection.

Reason	No. of participants	%
More privacy	9/18	50.0
No need for extra clinic visit	18/18	100.0
Greater physical comfort	9/18	50.0
Easy to perform	7/18	38.9
Desire for knowledge about own body	1/18	5.6
Desire for knowledge about performing the test	3/18	16.7

Table 4
Factors associated with perceived ability to self-perform vaginal screening.

	Perceived capability of self-performing vaginal screening		*p*
	Yes	No	
Age (y)	32.1 ± 4.6	32.3 ± 4.7	0.508
Education			
– primary	2/217 (0.9)	3/95 (3.2)	0.357
– secondary	83/217 (38.2)	41/95 (43.2)	
– tertiary	132/217 (60.8)	51/95 (53.7)	
Previous delivery	80/220 (36.4)	40/96 (41.7)	0.380
Previous cervical smear	155/221 (70.1)	74/96 (77.1)	0.222
Use of vaginal pessary	82/222 (36.9)	32/97 (33.0)	0.528
Tampon use	90/221 (40.7)	24/94 (25.5)	0.011
History of IUCD use	5/220 (2.3)	3/95 (3.2)	0.701
Self-check IUCD thread	1/4 (25)	1/3 (33.3)	> 0.999

Data are presented as *n* (%) unless otherwise indicated.
IUCD = intrauterine contraceptive device.

4. Discussion

The current available literature on GBS self-screening suggests that, in fact, a majority of women prefer self-screening,[9,12,13] and the accuracy of self-screening has been proven in several studies.[9–13] In some countries, self-screening is now a well-accepted practice, and resources that provide information about self-collection of genital swabs are available online.[5,7,14] Our study is the first investigation that examines the attitudes of women on GBS self-screening in a local population in Hong Kong. In contrast to existing studies, most women in our study preferred physician collection of samples rather than self-screening. However, this finding is not surprising given cultural differences. Unfortunately, ethnicity was not looked into specifically; although, it can be assumed that >80% of our patients were Chinese based on our departmental annual statistics.

Several factors that could affect a woman's view of self-screening were studied. The use of tampons is by far less common in Hong Kong than in western countries, and is the only factor associated with a perceived capability of taking a low vaginal swab and therefore self-screening. Furthermore, self-screening would involve taking a rectal swab, however, none of the examined factors were associated with a perceived capability of self-performing a rectal swab. Providing more information or having a dedicated nurse to explain GBS screening to the participants could have increased the proportion of women who would opt for self-screening, although this was not specifically studied. However, it was of particular interest that although most of our participants preferred clinician screening, a majority of them indicated they would like to try self-screening in their next pregnancy and would recommend self-screening to others. It is possible that the participants felt that they were capable of self-screening after

Table 5
Factors associated with perceived ability to self-perform rectal screening.

	Perceived capability of self-performing rectal screening		*p*
	Yes	No	
Age (y)	32.3 ± 4.6	32.1 ± 4.8	0.887
Education			
– primary	2/190 (1.1)	3/119 (2.5)	0.397
– secondary	69/190 (36.3)	52/119 (43.7)	
– tertiary	119/190 (62.6)	64/119 (53.8)	
Previous delivery	74/193(38.3)	45/121 (37.2)	0.905
Previous cervical smear	139/194 (71.6)	89/121 (73.6)	0.796
Use of vaginal pessary	68/195 (34.9)	47/122 (38.5)	0.549
Tampon use	77/194 (39.7)	37/119 (31.1)	0.147
History of IUCD use	5/193 (2.6)	3/120 (2.5)	> 0.999
Self-check IUCD thread	1/4 (25)	1/3 (33.3)	> 0.999

Data are presented as *n* (%) unless otherwise indicated.
IUCD = intrauterine contraceptive device.

Table 6
Relationship between perceived capability to self-perform the rectovaginal swabs and willingness to self-perform the swabs.

Perceived capability	Willingness to self-perform swabs		*p*
	Yes	No	
Vaginal swab	175/217 (80.6)	43/97 (44.3)	< 0.001
Rectal swab	158/217 (72.8)	33/95 (34.7)	< 0.001

Data are presented as *n* (%) unless otherwise indicated.

their experience with this study. However, further studies are needed to determine if this 'contradictory' finding is genuine or merely a misinterpretation of the wording in the questionnaire by the participants.

Price et al[9] suggested that less-educated women might be more reluctant to collect their own samples. Nevertheless, Hicks and Diaz-Perez[10] demonstrated that the accuracy of GBS self-screening was not affected among patients with limited education who were given minimal information about the collection technique. Most of the women in our study had at least secondary or tertiary qualifications and >50% were confident that they could take the vaginal and rectal swabs themselves. In the study by Law et al,[14] the clinician-obtained swabs caused mild to moderate pain in 68% of women and severe pain in 5% of women, in contrast to the self-sampled population where a majority of women described minimal pain and found the procedure acceptable. With an increasing amount of health information available, women are likely to wish to take an active role in healthcare and self-screening that would provide such autonomy. The next question that needs to be answered would be the accuracy and cost effectiveness of self-screening in the local population, which was not examined in our study. A larger and longer-period study involving multiple centers should also be performed to provide more information on this aspect.

In conclusion, most women in the local population still preferred physician-collected samples for GBS screening, however, they welcomed the option of self-screening in future pregnancies. Further studies that focus on the accuracy of self-screening and cost analysis are needed for GBS self-screening to be implemented.

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