Prévention de l'infection néonatale à streptocoque du groupe B

Stratégies des médecins à Winnipeg, au Manitoba

Gerald Konrad MD AAFP **Susan Hauch** MD CCFP **Christy Pylypjuk**

RÉSUMÉ

OBJECTIF Déterminer les stratégies des médecins de famille à Winnipeg, au Manitoba, pour prévenir l'infection néonatale à streptocoque du groupe B (SGB), les facteurs qui influencent leurs décisions et en quoi leurs décisions diffèrent de celles des obstétriciens locaux.

TYPE D'ÉTUDE Enquête de nature démographique.

CONTEXTE Cliniques de médecine familiale et d'obstétrique à Winnipeg.

PARTICIPANTS Quatre-vingt-cinq médecins et résidents avec privilèges d'accouchement à l'hôpital.

PRINCIPAUX PARAMÈTRES ÉTUDIÉS Méthodes individuelles de prévention de l'infection néonatale à SGB, facteurs influençant le choix des méthodes, et opinions sur la maladie néonatale à SGB et sur le dépistage prénatal systématique du SGB.

RÉSULTATS Environ 66% des médecins de famille et de leurs résidents suivaient les directives de la Société des obstétriciens et gynécologues du Canada (SOGC) pour le dépistage systématique du SGB et la prophylaxie antibiotique intrapartum de tous les porteurs de SGB. Ce chiffre est significativement inférieur à celui des obstétriciens, qui suivent ces directives dans une proportion de 87% ($P=0,001$). En comparaison, les obstétriciens avaient plus tendance que les médecins de famille à mentionner que les ouvrages scientifiques influençaient leur façon de prévenir le SGB néonatal ($P=0,001$). Les médecins de famille étaient plus susceptibles de mentionner l'influence de leurs pairs et collègues ($P=0,04$). L'incidence du SGB néonatal et celle de la mortalité associée étaient surestimées respectivement par 61% et 55% des obstétriciens et par 66% et 57% des médecins de famille. Malgré certaines inquiétudes concernant les risques et les coûts du dépistage et de la prophylaxie intrapartum systématiques, 92% des obstétriciens et 79% des médecins de famille estimaient que les avantages du dépistage systématique l'emportaient sur les inconvénients éventuels. Environ 24% des obstétriciens et 30% des médecins de famille étaient théoriquement d'accord pour exposer plus de10000 femmes à une prophylaxie antibiotique intrapartum pour prévenir un seul décès néonatal relié au SGB.

CONCLUSION Les médecins de famille avaient moins tendance que les obstétriciens à suivre les directives actuelles pour la prévention de l'infection néonatale à SGB. Cela pourrait correspondre à une façon différente d'envisager les soins. Les médecins de famille préfèrent que leurs patientes participent aux décisions de dépistage en étant bien informées des risques et avantages potentiels.

POINTS DE REPÈRE DU RÉDACTEUR

- Il existe actuellement 3 façons principales de prévenir l'infection néonatale à streptocoque du groupe B (SGB), lesquelles ont été adoptées par différents groupes. Il n'existe pas de directives pour la prévention de cette infection qui soient spécifiquement orientées vers le médecin de famille.
- Les auteurs de cette étude recommandent que de telles directives soient élaborées pour les médecins de famille et qu'elles incluent la participation des patientes à la prise de décision.
- Étant donné que les médecins de famille et les obstétriciens surestiment tous deux la prévalence de l'infection néonatale à SGB et la mortalité qui s'y rattache, une formation en ce domaine semblerait opportune.

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Prevention of neonatal group B streptococcal infection

Approaches of physicians in Winnipeg, Man

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ABSTRACT

OBJECTIVE To determine how family physicians in Winnipeg, Man, approach prevention of neonatal group B streptococcal (GBS) infection, what influences their decisions, and whether their decisions differ from those of local obstetricians.

DESIGN Population-based survey.

SETTING Family physicians' and obstetricians' practices in Winnipeg.

PARTICIPANTS Eighty-five physicians and residents with hospital labour floor privileges.

MAIN OUTCOME MEASURES Individual approaches to prevention of neonatal GBS infection, factors influencing choice of approach, and perceptions of neonatal GBS disease and universal prenatal GBS screening.

RESULTS About 66% of family physicians and their residents followed the Society of Obstetricians and Gynaecologists of Canada's (SOGC) guidelines for universal GBS screening and intrapartum antibiotic prophylaxis of all GBS carriers. This was significantly fewer than the 87% of obstetricians who followed these guidelines ($P=.026$). Obstetricians were more likely than family physicians to cite the literature as influencing their approach to neonatal GBS prevention ($P<.001$). Family physicians were more likely to cite the influence of peers and colleagues ($P=.04$). The incidence of neonatal GBS and its associated mortality were overestimated by 61% and 55% of obstetricians, and 66% and 57% of family physicians, respectively. Despite concerns about the risks and costs of universal GBS screening and intrapartum antibiotic prophylaxis, 92% of obstetricians and 79% of family physicians thought that the benefits of universal screening outweighed the concerns. About 24% of obstetricians and 30% of family physicians were theoretically willing to expose more than 10 000 women to intrapartum prophylactic antibiotics to prevent a single neonatal GBS-related death.

CONCLUSION Family physicians were less likely than obstetricians to follow current SOGC guidelines for prevention of neonatal GBS disease. This could reflect a different perspective on patient care. Family physicians want patients to be involved in screening decisions based on full disclosure of potential harm and benefit.

EDITOR'S KEY POINTS

- There are currently 3 main approaches to prevention of neonatal group B streptococcal (GBS) infection that are espoused by various groups. There are no guidelines for prevention of GBS infection designed specifically for family physicians.
- The authors of this study recommend that guidelines for family physicians be developed and that these guidelines incorporate patient involvement in decision making.
- Given that both family physicians and obstetricians overestimate the prevalence of GBS neonatal infection and the mortality associated with it, there is an opportunity for education in this area.

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It has been 40 years since the first published report on neonatal group B streptococcal (GBS) infection.[1] In 2004, the United States Centers for Disease Control and Prevention (CDC) reported an early-onset neonatal GBS infection rate of 0.32 cases per 1000 live births.[2] Reports indicated that neonatal GBS fatality rates dropped from up to 50% in the 1970s to 15%-to-20% in the 1980s, and finally to 5% in the late 1990s.[3,4] Despite this decline, GBS remains a leading cause of early-onset sepsis and meningitis in neonates.[5]

Guidelines on prevention of GBS have varied, depending on which professional body produced them. There are currently 3 approaches to prevention of neonatal GBS infection: universal screening of all pregnant women for GBS colonization along with intrapartum antibiotics for all women with positive results; universal GBS screening of all pregnant women and intrapartum antibiotics only for those with positive results as well as other risk factors for neonatal transmission; and intrapartum antibiotics for all women with risk factors for neonatal GBS transmission without prior screening.

In 1996, the CDC[6] recommended either the first or third approach. This recommendation was subsequently endorsed by the American College of Obstetricians and Gynecologists (ACOG)[7] and the Society of Obstetricians and Gynaecologists of Canada (SOGC).[8] In 2001, the Canadian Task Force on Preventive Health Care (CTFPHC) recommended either the first or second approach, promoting the second as most "efficient."[9] None of the North American guidelines recommend involving patients in decisions on GBS screening and prevention.

Based on a retrospective study reported in the *New England Journal of Medicine*[10] in 2002, the CDC[11] and ACOG[12] narrowed their recommendations to the first approach alone. In September 2004, the SOGC followed suit.[13]

It is unclear how family physicians approach neonatal GBS prevention in an environment of changing recommendations. No recommendations have been developed with family physicians in mind. Patients have not been included in the decision-making process. Evidence-based recommendations from organizations on which family physicians often rely, such as the CTFPHC[14] and the Cochrane Collaboration,[15] do not incorporate more recent studies. Despite the consistency of CDC, ACOG, and SOGC recommendations, questions remain regarding the safety of universal prenatal GBS screening and antibiotic prophylaxis for all asymptomatic GBS carriers.[16-19]

Professional bodies from other parts of the world have not endorsed universal prenatal GBS screening. In 2003, the Royal College of Obstetricians and Gynaecologists in the United Kingdom recommended against offering antenatal GBS screening and promoted discussion with patients regarding intrapartum antibiotic prophylaxis based on specific risk factors.[20] In 2004, the New Zealand GBS Consensus Working Party recommended a risk-based prevention strategy rather than universal screening.[21]

We developed a survey to determine whether family physicians in Winnipeg have a consistent approach to prevention of neonatal GBS disease and whether this approach is similar to that of Winnipeg obstetricians. The survey asked whether family physicians chose a strategy based on guidelines, perceived standard of care, or other factors, and whether such factors were similar to those influencing obstetricians. It also asked about physicians' perceptions of the risks and benefits of universal GBS screening as recommended by the SOGC, whether the perceptions of family physicians and obstetricians differed, and whether these perceptions were reflected in physicians' practices.

We anticipated that family physicians and obstetricians would approach neonatal GBS prevention differently. Since there are few prenatal guidelines generated by and available to family physicians, we anticipated that their decisions on neonatal GBS prevention would more likely be influenced by the example of others than obstetricians' decisions would be.

METHODS

This nonrandomized, population-based survey was conducted in Winnipeg. Ethics approval was obtained from the University of Manitoba Research Ethics Board. The survey was conducted by a medical student between June 2004 and June 2005. The survey was first pilot tested for clarity and potential for bias among physicians practising obstetrics outside the Winnipeg region.

Winnipeg has a population of about 650 000. At the time of the study, intrapartum care was provided at 2 tertiary care teaching hospitals (79% of deliveries) and 1 community hospital. Prenatal and intrapartum care in Winnipeg is provided by family physicians, obstetricians, and midwives. University of Manitoba residents enrolled in both family medicine and obstetrics-and-gynecology residency programs participate in prenatal care in the context of their training. Most intrapartum care provided at the teaching hospitals involves residents.

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Table 1. Physicians interviewed

PHYSICIANS	NO. INTERVIEWED (% OF TOTAL)	NO. ELIGIBLE (% OF ALL ELIGIBLE)
Obstetricians	21 (25)	41 (51)
Family physicians	23 (27)	58 (40)
Obstetric residents	17 (20)	25 (68)
Family medicine residents	24 (28)	40 (60)
TOTAL	85 (100)	164 (52)

During the period of the study, the Winnipeg Regional Health Authority reported there were 41 obstetricians and 58 family physicians with regional hospital labour and delivery privileges. There were also 40 family medicine residents and 25 obstetric residents with these privileges.

Candidates were recruited through face-to-face or telephone conversations by the medical student conducting the interviews. She tried to contact all 164 eligible physicians or their clinic representatives. About 50% (n=85) of eligible obstetricians, family physicians with obstetric privileges, and residents in family medicine or obstetrics were interviewed (**Table 1**). Informed consent was obtained from each physician using the University of Manitoba Research Ethics Board's approved consent form.

Interviews were conducted in a variety of settings, such as physicians' clinics, residency clinics, and labour wards at the 3 hospitals then providing intrapartum care: St Boniface General Hospital, Victoria General Hospital, and the Health Sciences Centre.

Data were analyzed using SPSS statistical software, version 10.0. Differences between groups were analyzed with the χ^2 test. Statistical significance was set at $P<.05$.

RESULTS

All obstetricians and obstetric residents reported using a specific consistent approach to prevention of early-onset neonatal GBS disease, and almost all (91.5%) family physicians and family medicine residents also reported using a specific approach. All obstetricians and obstetric residents did universal screening; 87% prescribed intrapartum antibiotics to all GBS carriers, and the remaining 13% reserved intrapartum antibiotics for GBS carriers with other risk factors for neonatal GBS transmission. Only 66% of family physicians and family medicine residents (significantly fewer than obstetricians [$P=.026$]) did universal screening and gave intrapartum antibiotics to all GBS carriers. About 23% did universal screening and gave intrapartum antibiotics only to women with other risk factors, 2% used a risk-based approach to neonatal GBS prevention, and 9% reported no consistent approach. Residents' approaches to neonatal GBS prevention were similar to those of the physicians in their respective disciplines.

Table 2. Factors reported to influence choice of approach to prevention of neonatal group B streptococcal disease

FACTOR	OBSTETRICIANS N (%)	FAMILY PHYSICIANS N (%)	OBSTETRIC RESIDENTS N (%)	FAMILY MEDICINE RESIDENTS N (%)
Literature*†	18 (86)	7 (30)	15 (88)	11 (46)
Community standard	14 (67)	15 (65)	4 (24)	10 (42)
Low risk-benefit ratio	2 (9)	1 (4)	2 (12)	0
High cost-effectiveness	2 (10)	0	1 (6)	1 (4)
Recommended by Society of Obstetricians and Gynaecologists of Canada	10 (48)	14 (61)	9 (53)	17 (71)
Recommended by Canadian Task Force on Preventive Health Care	2 (10)	3 (13)	1 (6)	3 (13)
Recommended by American College of Obstetricians and Gynecologists and National Institutes of Health	0	1 (4)	3 (18)	2 (8)
Recommended by other professional bodies	2 (10)	1 (4)	1 (6)	0
Recommended by hospital	4 (19)	7 (30)	3 (18)	4 (17)
Example of peers, colleagues‡	5 (24)	15 (65)	6 (35)	9 (38)
Examples of instructors§	0	3 (13)	6 (35)	18 (75)
Other¶	4 (19)	2 (9)	0	0

*Significant difference between obstetricians and family physicians ($P<.001$).
†Significant difference between obstetric and family medicine residents ($P=.005$).
‡Significant difference between obstetricians and family physicians ($P=.037$).
§Significant difference between obstetric and family medicine residents ($P=.011$), significant difference between combined residents and combined practising physicians ($P<.001$).
¶Significant difference between combined practising physicians and combined obstetric and family medicine residents ($P=.014$).

Among factors influencing physicians' approaches to neonatal GBS prevention, practising obstetricians most frequently cited the literature, community standards, and SOGC recommendations, in that order. Practising family physicians most frequently cited the example of their peers, community standards, and SOGC recommendations. Obstetric residents cited the literature, SOGC recommendations, and the example of peers and instructors, and family medicine residents cited the example of instructors, SOGC recommendations, and the literature (**Table 2**).

There were few statistically significant differences in factors influencing choice of approach. Practising family physicians cited the example of peers significantly more frequently than obstetricians did ($P=.037$). Practising physicians were more likely than residents to cite factors other than those listed in the survey ($P=.014$). Of the 6 physicians citing other factors, 3 mentioned prior experience with neonates with GBS infection.

To assess the perceived clinical relevance of GBS infection, physicians were asked to estimate its incidence in the community. In all, 37% of obstetricians and 28% of family physicians correctly indicated an incidence of 1/1000 to 1/5000 as generally cited in the literature.[2,4] Incidence was overestimated by 61% of obstetricians and 66% of family physicians.

The survey also asked about physicians' perceptions of the mortality owing to neonatal GBS infection. About 29% of obstetricians and 26% of family physicians correctly indicated a mortality of 1% to 5%; 55% of obstetricians and 57% of family physicians thought the mortality was higher than 5%, and 10% of obstetricians and 6% of family physicians assumed a mortality >20%. There were no significant differences between family physicians, obstetricians, or residents in any of these perceptions (**Table 3**).

Physicians were asked about their perceptions of the risk associated with intrapartum antibiotic prophylaxis for all known GBS carriers. None of the differences in responses between disciplines were statistically significant (**Table 4**).

Table 3. Perceptions of the incidence and mortality of neonatal group B streptococcal disease

	OBSTETRICIANS AND OBSTETRIC RESIDENTS N (%)	FAMILY PHYSICIANS AND FAMILY MEDICINE RESIDENTS N (%)
PERCEIVED INCIDENCE		
<1/100	1 (3)	2 (4)
1/100-499	11 (29)	13 (28)
1/500-1000	11 (29)	16 (34)
1/1000-5000*	14 (37)	13 (28)
>1/5000	1 (3)	3 (6)
PERCEIVED MORTALITY (%)		
<1	6 (16)	8 (17)
1-5*	11 (29)	12 (26)
6-10	5 (13)	14 (30)
11-20	12 (32)	10 (21)
>20	4 (10)	3 (6)

*Correct response.

Table 4. Obstetricians' and family physicians' perceptions of the risks, benefits, and effectiveness of universal group B streptococcus screening and antibiotic prophylaxis

RISKS, BENEFITS, AND EFFECTIVENESS	OBSTETRICIANS AND OBSTETRIC RESIDENTS N (%)	FAMILY PHYSICIANS AND FAMILY MEDICINE RESIDENTS N (%)
Is universal antibiotic use associated with an increased neonatal gram-negative infection rate?		
• Yes or probably	14 (37)	10 (21)
• No or unlikely	24 (63)	37 (79)
Is universal antibiotic use associated with increased penicillin anaphylaxis?		
• Yes or probably	8 (21)	19 (40)
• No or unlikely	30 (79)	28 (60)
Is universal antibiotic use associated with increased hospital costs?		
• Yes or probably	14 (37)	25 (54)
• No or unlikely	24 (63)	22 (47)
How effective are antibiotics in preventing neonatal GBS disease?		
• Completely or very effective	36 (95)	39 (83)
• Somewhat effective or ineffective	2 (5)	8 (17)
Do the benefits of universal antibiotics outweigh the risks?		
• Yes or probably	35 (92)	37 (79)
• No or unlikely	3 (8)	10 (21)

When asked how many women they would theoretically be willing to expose to intrapartum prophylactic antibiotics to prevent a single neonatal GBS-related death, 24% of obstetricians and 30% of family physicians indicated more than 10 000 women. About 11% of obstetricians and 9% of family physicians reported they were willing to expose >50 000 women. There were no statistical correlations between numbers of women they were willing to expose to intrapartum antibiotics to prevent a single neonatal death and perceived incidence or mortality owing to neonatal GBS disease. There were also no correlations between these factors and the perceived risk or effectiveness of intrapartum antibiotics.

DISCUSSION

While most family physicians in our community do universal screening for prevention of neonatal GBS-related disease, they have been more reluctant to accept this recommendation than their obstetric colleagues. The most recent survey looking at GBS screening patterns in Canada showed that in 1997, 87% of family physicians in Alberta and Toronto did routine prenatal GBS screening.[22] This surpassed the 78% of obstetricians reporting such screening, but was at a time when risk-based GBS prevention rather than universal prenatal screening was a recommended option. In Winnipeg in 2005, 89% of family physicians reported doing routine prenatal screening, as did all obstetricians. While it is difficult to extract specific screening strategies from the 1997 study for comparison, it appears that obstetricians have been more responsive to evolving GBS recommendations than family physicians have if practice patterns in Alberta and Toronto accurately reflected those in Manitoba in 1997.

Our study showed that family physicians were more likely than obstetricians to consider the example of others when choosing an approach to GBS prevention. This is not surprising in an environment where the only current recommendations come from specialist organizations. This difference in practice might reflect the lack of guidelines developed specifically from the perspective of family physicians.

Family physicians work with undifferentiated, low-risk populations, so their perspective on pregnancy and labour is different from that of obstetricians whose management decisions must encompass the concerns of high-risk pregnancies. Given their patient population, family physicians enjoy the luxury of practising from the perspective of pregnancy as a usually normal and healthy process. This results in an approach to normal pregnancy care that is open to patient involvement in decision making, particularly when a defined course of action is not mandated by urgent concerns for patient safety. Guidelines developed from this unique perspective should include discussion of the possible benefits and harm of universal screening and risk-based screening for prevention of neonatal GBS disease. We believe that such guidelines would add value to the care of family physicians' obstetric patients.

An exaggerated perception of the incidence and mortality of neonatal GBS infection might contribute to family physicians following the universal screening guidelines promoted by the SOGC. It is unknown how such misperceptions could bias decisions around screening strategies.

Limitations

This study was limited by its inability to include all eligible respondents in the survey; about half the eligible respondents were interviewed. This limitation and our own strong opinions and knowledge of the topic might have biased our results. Residents' practices were shown to reflect those of their staff counterparts and, therefore, might not represent independent results. The contribution of midwives, who provide some intrapartum care, might colour the approach to neonatal GBS prevention in Winnipeg, but this issue was not addressed in this study.

Conclusion

Most family physicians in Winnipeg do universal screening and prescribe antibiotic prophylaxis to all GBS carriers for prevention of neonatal GBS disease; even more obstetricians do so (66% vs 87%). In considering their approach, both family physicians and obstetricians are influenced by SOGC guidelines and by community standards of care.

The difference in universal screening rates might reflect the fact that family physicians practise from a different perspective than obstetricians and lack prenatal and obstetric guidelines developed from family physicians' perspectives. Their approach to patient management emphasizes a relationship based on patient-centred care. Family physicians need guidelines that allow for patient involvement in decision making based on discussion of the possible benefits and harm of prenatal screening and universal antibiotic prophylaxis for GBS carriers.

Further research is needed to determine whether overestimating the risk of neonatal infection plays a role in the implementation of practice guidelines, particularly when patients are involved in decision making based on discussions with physicians who have such misperceptions.

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Contributors

Drs Konrad *and* **Hauch** *conceived and designed the study, analyzed and interpreted the data, and prepared the article for submission.* **Ms Pylypjuk** *conducted the survey.*

Competing interests

None declared

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