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Antibiotic prophylaxis at the time of induced abortion

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Postabortion infection after therapeutic abortion, although uncommon, may have devastating consequences including infertility, ectopic pregnancy, and pelvic pain syndrome.

Objective: To define a standard protocol for antibiotic prophylaxis at the time of induced abortion.

Data source and selection: Our working group reviewed the world literature as well as data on infections and demographics among women seeking abortion in BC.

Main results: Several meta-analyses show benefit in providing universal antibiotic prophylaxis to women seeking abortion, and this is most advantageous for women at low risk for Chlamydia trachomatis infection. Postoperative morbidity is usually the result of untreated preoperative bacterial vaginosis or C. trachomatis infection. We suggest standard preoperative prophylaxis as follows: all women should be prescreened for bacterial vaginosis, C. trachomatis, and Neisseria gonorrhoea, and treated for infection prior to the procedure. When prescreening is not feasible, all women should receive metronidazole and women at high risk for C. trachomatis should also receive azithromycin. Further, we suggest methods for enhanced documentation of abortion outcomes.

Conclusion: Significant sequelae of postabortion infections, although rare, may be reduced by employing the recommended prophylactic regimen.

Introduction

In November 2000 a group of provincial experts, including representatives from the BC Centre for Disease Control, doctors who provide abortions, and staff from the three major abortion clinics in Vancouver, met to define the standards for antibiotic prophylaxis at the time of induced abortion.

Background

Therapeutic abortion is one of the most common medical procedures performed in BC and Canada: 15 500 per year in BC and 114 000 per year in Canada.[1] Of women surveyed in 1992, 43% of American women and 30% of Canadian women had undergone a therapeutic abortion at some time in their life.[2] In developing countries women tend to seek abortion primarily to limit family size, whereas in Canada, the predominant reason for seeking abortion tends to be to delay childbearing. In view of this it is imperative to protect the future fertility of the young women in BC seeking abortion.

The risk to fertility

After an abortion, the main risk to fertility is the development of pelvic inflammatory disease (PID), an inflammation of the endometrium, fallopian tubes, pelvic peritoneum and/or contiguous structures. PID is thought to be caused by the ascending spread of microorganisms from the vagina and cervix into the genital tract. These organisms can either be sexually transmitted, as in the case of *Chlamydia trachomatis* and *Neisseria gonorrhoea*, or endogenous genital tract flora, as in the case of bacterial vaginosis.[3] Any instrumentation of the cervix enhances the ascending spread of these organisms and, hence, the risk of PID. The incidence of cervico-vaginal infection among women seeking abortion in the three Lower Mainland abortion clinics is reported as follows: Infection due to *C. trachomatis:* 2% to 3%; *N. gonorrhoea:* <1:500; bacterial vaginosis: 23%. (W.V.N., unpublished data presented to the Group to Standardize Antibiotic Prophylaxis at the Time of Induced Abortion, Vancouver, November 2000).

Sequelae of untreated PID

The consequences of untreated PID are significant. In addition to being a cause of chronic pelvic pain and dyspareunia, many women will go on to have problems with infertility and ectopic pregnancy. One study showed that 11% of women with PID developed infertility after one episode, 23% after two episodes, and 54% developed infertility after three or more episodes of PID.[4] The risk of ectopic pregnancy is increased eight- to tenfold in women who have had an episode of PID as compared to women who have never had the disease.[5] Evidence is increasing that acute PID with abdominal pain as the chief complaint may represent the tip of the iceberg, with many more women having asymptomatic PID.[6]

The role of STD pathogens

Neisseria gonorrhoea has been isolated from the cervix, endometrium, fallopian tubes, pelvic cavity, and perihepatic space. Approximately 10% to 19% of women with cervical N. gonorrhoea go on to develop PID.[4] However, declining rates of *N. gonorrhoea* in Canada and other Western countries has meant the percentage of PID caused by this agent has drastically decreased in the past 15 to 20 years.

Chlamydia trachomatis has been isolated from the cervix, endometrium, and fallopian tubes and is an established, important etiologic agent in the development of PID. Studies reveal 35% to 90% of women with tubal infertility have

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antibodies to *C. trachomatis*, a significantly higher percentage than in controls, indicating that *C. trachomatis* infections are related to significant tubal damage.[4]

The role of bacterial vaginosis

Bacterial vaginosis is defined as an altered ecologic state of the vagina that is characterized by the predominance of anaerobic bacteria, the lack of leukocytes, a decrease in hydrogen ion concentration, and a significant reduction in lactobacilli. There is a loss of the protective milieu created by the lactobacilli, which decreases the defence against pathogens. The lactobacilli produce lactic acid, which maintains a low pH (<4.5) and inhibits the growth of most other vaginal bacteria. In addition, many lactobacillus species produce hydrogen peroxide, which inhibits the growth of noncatalase-producing microorganisms. The combination of the hydrogen peroxide and a halide ion with peroxidase, all of which are found in abundance in the cervix and endometrium, creates a potent bactericidal system. Accompanying this loss of defence against pathogens, bacterial vaginosis organisms have been shown to alter the cervical mucous barrier through enzymatic degradation by proteolytic enzymes, which facilitates the ascent of pathogenic organisms.[7]

There is a positive correlation between the number of bacterial vaginosis organisms and rate of postabortion PID—the greater the number of organisms, the higher the rate of PID.[8] Bacteria can increase by as much as one thousandfold in bacterial vaginosis. In a University of Washington study, cultures from women with PID showed 94% had bacterial vaginosis organisms on culture of endometrial biopsy tissue. Tubal swab and peritoneal fluid specimens yielded a frequency of 56% bacterial vaginosis organisms.[9] This association between bacterial vaginosis-associated organisms and endometritis was independent of *N. gonorrhoea* and *C. trachomatis* infections, suggesting that bacterial vaginosis microorganisms in the endometrium increase the risk of endometritis among both women with and without STD pathogens.

Other investigators have reported a more than fivefold increase in the relative risk of postabortion endometritis among women with microscopic characteristics of bacterial vaginosis.[10] Furthermore, bacterial vaginosis may contribute to the risk of postabortion endometritis in women with *C. trachomatis*. Blackwell and colleagues showed that C. trachomatis positive women had a higher rate of infection if they also had concomitant bacterial vaginosis.[11] Conversely, treatment with bacterial vaginosis prophylaxis alone (without treatment for *C. trachomatis*) decreased the incidence of postabortion PID in C. trachomatis positive women.[11,12]

Hillier and colleagues studied the role of bacterial vaginosis and bacterial vaginosis-associated organisms in endometritis and concluded that anaerobic gram-negative rods were a pathogenic agent in the development of endometritis.[9]

Rationale for prophylaxis

Over the last few years there have been many studies on the use of antimicrobial agents given at the time of induced abortion, and the majority of these demonstrate that providing universal prophylaxis against *C. trachomatis* and bacterial vaginosis profoundly reduces morbidity in women seeking termination of pregnancy and substantially reduces total treatment costs.[10-12]

Evidence for type of prophylaxis

Looking back at the first 10 years after legalized abortion in the USA, Park and colleagues analyzed the outcome of postoperative febrile complications and found antibiotic prophylaxis (using either doxycycline or metronidazole) to be the most protective factor, reducing the development of fever by one-third.[13]

Other studies done in the 1980s and early 1990s showed the use of either doxycycline or metronidazole significantly reduced the rate of postabortion PID.[14,15] A meta-analysis done in 1996 by Sawaya and colleagues again demonstrated the use of either of these agents reduced the rate of postabortion PID by half.[16] Sawaya concluded that no further placebo-controlled trials should be performed as there was a substantial protective effect in all subgroups, including low-risk women.

In 1993, Blackwell and colleagues advocated a policy whereby all women requesting abortion were tested for *N. gonorrhoea* and *C. trachomatis* and given prophylactic antibiotics (universal prophylaxis) to cover *C. trachomatis* and bacterial vaginosis.[17] This gives the benefit of coverage for potential infection without having to wait for results. It also allows for appropriate contact tracing and follow-up for those testing positive. A cost-benefit analysis showed this strategy to be cost effective.

In 1999, Blackwell and colleagues carried out an audit of short-term health gains of using universal prophylaxis against *C. trachomatis* and bacterial vaginosis in women attending for suction termination of pregnancy.[11] A total of 1951 women were audited, and again the introduction of universal prophylaxis was shown to profoundly reduce morbidity and resulted in substantial financial savings.

In 1997, a large multicentre study (N = 1672) was undertaken by Penney and colleagues comparing the above universal prophylaxis regimen to a “screen-and-treat” regimen.[18] The prophylaxis group received metronidazole 1 g rectally plus doxycycline 100 mg b.i.d. for 10 days. The screen-and-treat group received antibiotics only if genital tract swabs (for N. gonorrhoea, *C. trachomatis*, and bacterial vaginosis) done at a pre-abortion visit were positive. The women managed by the screen-and-treat regimen, particularly those whose swabs tested negative, had slightly higher rates of infective morbidity than the women managed by universal prophylaxis. Notably, any decrease in postabortion morbidity was associated with a significant decrease in costs. However, this study utilized an older enzyme immunoassay for *C. trachomatis*, so the introduction of the more sensitive DNA-amplification techniques for testing *C. trachomatis* may improve the outcome of a screen-and-treat approach by minimizing the number of false negative tests.

Unpublished data (W.V.N., presented to the Group to Standardize Antibiotic Prophylaxis at the Time of Induced Abortion, Vancouver, November 2000) from a freestanding abortion clinic in Vancouver reveals that infection rates were decreased from 3% with no formal prophylaxis to 0.4% to 1.0% with doxycycline or azithromycin and to 0.5% with metronidazole plus azithromycin. Unfortunately, the quality of this data is impaired by the follow-up rate of less than 40%.

Options for management

From our review and considering levels of evidence,[19] we conclude that there are two optimal treatment choices—a screen-and-treat approach (Level 1 evidence) or testing and universal prophylaxis at one visit (Level 2 evidence).

Screen and treat

The screen-and-treat approach is only valuable where there is provision for a pre-abortion visit and time to wait for results before the procedure. In this circumstance, testing for *N. gonorrhoea*, *C. trachomatis*, and bacterial vaginosis is

recommended, utilizing a nucleic acid test for *C. trachomatis*, culture for *N. gonorrhoea*, and gram stain or clinical examination (using Amsel's criteria) for bacterial vaginosis.[20] When a sensitive nucleic acid test is available for *N. gonorrhoea*, this can be employed. As per standard STD guidelines, any woman testing positive for *C. trachomatis* or *N. gonorrhoea* should be treated and have her partner(s) tested and treated.[5]

Universal prophylaxis

In a situation where a pre-abortion visit does not occur, both screening and prophylaxis at the one visit is the most effective strategy for decreasing the rates of postabortion PID and decreasing costs. Ideally, prophylaxis would cover both *C. trachomatis* and bacterial vaginosis for all women. Considering the high cost of azithromycin, a less expensive approach is to divide the women into two groups: those at low risk and those at high risk for infection with *C. trachomatis*.

Individuals identified as being at high risk for *C. trachomatis* infection include those who are age 20 or less, those who have had three or more sexual partners in the last year, those with a past history of PID or an STD in the past 10 years, those who present with clinical cervicitis, and those who have a sexual partner with other partners or with a history or symptoms of an STD[21] (see Table 1).

Women in both groups should receive metronidazole to cover bacterial vaginosis, but only those in the high-risk group should be given azithromycin as well to cover *C. trachomatis*. Women in both groups should be tested for *C. trachomatis* and *N. gonorrhoea* to allow for appropriate treatment and contact tracing of partners to avoid reinfection.[5] Bacterial vaginosis testing is not necessary as all women will receive treatment for this and there are no contact tracing implications with bacterial vaginosis.

The disadvantage of not treating all women with azithromycin is that some low-risk women will be infected with *C. trachomatis* and may not be treated. Provincial funding for universal prophylaxis with azithromycin is not currently available.

Proposed prophylaxis

It is recommended that metronidazole 2 g orally or rectally be given at 30 minutes preoperatively for all women (Table 2). Women who qualify as high risk for *C. trachomatis* (see Table 1) should also receive 1 g azithromycin orally in the recovery room.

Women who present the day before the abortion for laminaria insertion should receive metronidazole 500 mg b.i.d. for 2 days started at least 30 minutes before the laminaria. Azithromycin, if indicated, can be given postoperatively.

Women who are having an abortion under general anesthetic can receive either metronidazole 2 g orally or rectally on the day of the procedure or, alternatively, metronidazole 500 mg b.i.d. for 2 days started the day before the procedure.[22] Azithromycin, if indicated, can be given postoperatively.

Enhanced follow-up

Currently in BC, there is inadequate documentation of abortion outcomes. The Lower Mainland abortion clinics, which perform more than half of the abortions in BC, receive follow-up data on only about one-third of the women seen. To adequately assess the efficacy of this proposed prophylaxis we need to increase our follow-up rates by ensuring follow-up from emergency rooms, walk-in clinics, Planned Parenthood, and other health facilities. To help with this we have developed a form (see Figure 1) that will be distributed to these centres. There will be an initiative to increase self-reporting of outcome by the patient; for this we have developed a letter which will be given to the patient with a stamped, addressed envelope with instructions to return it in 1 month (see Figure 2). This letter has no reference to abortion. This enhanced follow-up strategy is to be piloted soon.

Conclusion

Preventing these complications is particularly important in Canada and BC, where most women tend to seek abortion to delay childbearing. Postabortion infection is increasingly linked to bacterial vaginosis, present in about 23% of BC women seeking abortion. Several studies have shown two methods to be effective in improving postabortion outcomes and reducing costs—prescreening and treating bacterial vaginosis and STDs prior to abortion, and universal prophylaxis. The working group proposes that all British Columbian women undergoing elective abortion should be protected with one of these prophylactic regimens. Further, we propose to implement a system to enhance collection of outcome data to help document the efficacy of these regimens.

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Competing Interests

None declared.

Table 1. Definition of "high risk" for chlamydia infection.

Individuals are considered to be at a high risk for chlamydia infection if any of the following apply:
• Age 20 or less.
• Three or more sexual partners in the past year.
• Past history of PID or an STD in the last 10 years.
• Clinical cervicitis.
• Sexual partner who has other partners or has a history of STD or STD symptoms.

Table 2. Peri-operative antibiotics for therapeutic abortion.

Screen-and-treat group—women presenting prior to abortion for evaluation
Treat women testing positive on preoperative testing only. Treatment may be given on receipt of positive results or, if on day of procedure, as follows:
• Positive bacterial vaginosis: Rx metronidazole 2 g orally or rectally at least half an hour

preoperatively.
• Positive C. trachomatis: Rx azithromycin 1 g orally postoperatively.

Women presenting same day for abortion
• Metronidazole 2 g orally at least 30 minutes preoperatively for all women, plus
• Azithromycin 1 g orally postoperatively for women at high risk for C. trachomatis infection.
Women presenting the day before for laminaria insertion
• Metronidazole 500 mg b.i.d. for 2 days started at least 30 minutes before the laminaria insertion, plus
• Azithromycin 1 g orally postoperatively for women at high risk for C. trachomatis infection.

Women having the abortion under general anesthetic
• Manage as a screen-and-treat patient if time permits, or
• Metronidazole 2 g orally* or rectally given on the day of the procedure, or
• Metronidazole 500 mg orally* b.i.d. for 2 days started the day before, plus
• Azithromycin 1 g orally postoperatively for women at high risk for C. trachomatis infection

* Taken with a small sip of water when taken the day of the general anesthetic

[Contents]

Figure 1 and Figure 2 are also available in PDF format [Requires Adobe Acrobat]

Figure 1. Abortion follow-up form.

ABORTION FOLLOW-UP

Please complete as fully as possible.

Patient label (or)
Patient's name: _____
D.O.B.: _____

1. Date seen:
_____

2. Emergency room/clinic location:
_____

3. Where was the abortion performed?
Everywoman's (Commercial/Broadway)
Elizabeth Bagshaw (1177 West Broadway)
C.A.R.E. (BC's Women's Hospital, 4500 Oak Street)
Other (please be as specific as possible):
_____

4. Date of performed abortion: _____

5. Diagnosis at this visit:
_____
_____
_____

6. Treatment at this visit:
_____
_____
_____

No problems

Please fax to C.A.R.E. Program at Children's and Women's Health Centre.
Fax: (604) 875-3274
PLEASE SHRED AFTER FAXING

[Contents]

Figure 2. Patient's self-report at 1 month post-procedure.

Date: _____ Chart number: _____

Please complete the following 1 month after your procedure and return it to us in the prepaid addressed envelope.

1. I have experienced no problems
I have had a problem

2. If you have had a problem please describe:
_____
_____
_____
_____
_____
_____

3. What did you do about this problem?:
_____
_____
_____
_____
_____
_____

4. Did you call the emergency number you were given by the clinic? Yes No

References

Top

1. Trudeau R. Therapeutic abortions in Canada, 1996 and 1997. In: The Daily, 7 April 2000. Statistics Canada Daily Update. http://www.statcan.ca/Daily/English/000407/d000407c.htm (7 April 2000; retrieved 15 July 2002).

2. Henshaw SK. Unintended pregnancy and abortion: A Public Health Perspective. In: Paul M, Lichtenberg ES, Borgatta L, et al. A Clinician's Guide to Medical and Surgical Abortion. Camden Town: Churchill-Livingstone Press, 1999:11-22.

3. Westrom L, Eschenbach D. Acute pelvic inflammatory disease. In: Holmes KK (ed). Sexually Transmitted Diseases. 3rd ed. New York, NY: McGraw-Hill, 1999:783-784.

4. Money DM. Identifying the cause of pelvic inflammatory disease. Can J Diagnosis 1994;11:67-80.

5. Health Canada. Canadian STD Guidelines, 1998. http://www.hc-sc.gc.ca/hpb/lcdc/publicat/std98/index.html (21 June 2000; retrieved 15 July 2002).

6. Sellors JW, Mahony JB, Chernesky MA, et al. Tubal factor infertility: An association with prior C. trachomatis infection and asymptomatic salpingitis. Fertil Steril 1988;49:451-457. PubMed Abstract

7. Soper DE, Brockwell NJ, Dalton HP, et al. Observations concerning the microbial etiology of acute salpingitis. Am J Obstet Gynecol 1994;170:1008-1014. PubMed Abstract

8. Larsson PG, Bergman B, Forsum U, et al. Mobiluncus and clue cells as predictors of PID after first trimester abortion. Acta Obstet Gynecol Scand 1989;68:217-220. PubMed Abstract

9. Hillier SL, Kiviat NB, Hawes SE, et al. Role of bacterial vaginosis-associated microorganisms in endometritis. Am J Obstet Gynecol 1996;175:435-441. PubMed Abstract

10. Penney GC. Preventing infective sequelae of abortion. Hum Reprod 1997;12(11 suppl):107-112. PubMed Abstract

11. Blackwell AL, Emery SJ, Thomas PD, et al. Universal prophylaxis for Chlamydia trachomatis and anaerobic vaginosis in women attending for suction termination of pregnancy: an audit of short-term health gains.Int J STD AIDS 1999;10:508-513. PubMed Abstract

12. Heisterberg L, Petersen K. Metronidazole prophylaxis in elective first trimester abortion. Obstet Gynecol 1985;65:371-374. PubMed Abstract

13. Park TK, Flock M, Schulz KF, et al. Preventing febrile complications of suction curettage abortion. Am J Obstet Gynecol 1985;152:252-255. PubMed Abstract

14. Stevenson MM, Radcliffe KW. Preventing pelvic infection after abortion. Int J STD AIDS 1995;6:305-312. PubMed Abstract

15. Larsson PG, Platz-Christensen JJ, Thejls H, et al. Incidence of pelvic inflammatory disease after first trimester legal abortion in women with bacterial vaginosis after treatment with metronidazole: A double-blind, randomized study. Am J Obstet Gynecol 1992;166:100-103. PubMed Abstract

16. Sawaya GF, Grady D, Kerlikowske K, et al. Antibiotics at the time of induced abortion: The case for universal prophylaxis based on a meta-analysis. Obstet Gynecol 1996;87:884-890. PubMed Abstract

17. Blackwell AL, Thomas PD, Wareham K, et al. Health gains from screening for infection of the lower genital tract in women attending for termination of pregnancy. Lancet 1993;342:206-210. PubMed Abstract

18. Penney GC, Thomson M, Norman J, et al. A randomized comparison of strategies for reducing infective complications of induced abortion. Br J Obstet Gynaecol 1998;105:599-604. PubMed Abstract

19. Wool ST, Battista RN, Angerson GM, et al. Canadian Task Force on the Periodic Health Exam. Ottawa, ON: Canada Communication Group. 1994:xxxvii.

20. Amsel R, Totten PA, Spiegel CA, et al. Nonspecific vaginosis—Diagnostic criteria and microbial and epidemiological associations. Am J Med 1983;74:14-22. PubMed Abstract

21. National Abortion Federation. Clinical Policy Guidelines. Washington, DC: NAF, 2001.

22. Crowley T, Low N, Turner A, et al. Antibiotic prophylaxis to prevent postabortal upper genital tract infection in women with bacterial vaginosis: Randomized controlled trial. BJOG 2001 Apr;108:396-402. PubMed Abstract

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