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Contraception Methods for HIV-Positive Women and Women at Risk of HIV

This evidence review is part of a series on HIV prevention and control produced by the National Collaborating Centre for Infectious Diseases. It is intended to inform public health practitioners and community-based workers and guide their practice.

Women living with HIV/AIDS (WHA), like other women, may wish to avoid unplanned or unwanted pregnancies. Women should be offered a wide range of contraceptive methods in order to make informed choices regarding reproduction. Twenty-five percent of WHA worldwide have an unmet need for contraception (1). More importantly, contraceptive methods must not increase the risk of HIV transmission to women at risk of HIV, increase disease progression or mortality rate in WHA, or increase incidence of sexually transmitted infections (STIs) and/or other related infections in this already vulnerable population.

This evidence review outlines some contraceptive methods for WHA and women at risk of HIV. This paper does not include all types of contraception as research related to HIV is lacking. However, other methods not described herein have been deemed safe for use by the World Health Organization (WHO) for use by WHA and those at risk of HIV (2). These include levonorgestrel and etonogestrel implants, combined contraceptive patch, vaginal ring, and traditional/rhythm methods. No Canadian studies were found on abortion or emergency contraception among WHA; however, given contraceptive failures, it is important that WHA have access to these methods.

What is the Prevalence of Contraceptive Use?

In Canada, the prevalence of contraceptive use is 75% (3). While there is a dearth of published data specific to WHA, a 2002 Canadian study reported the most frequently used methods were oral contraceptives (OCs) at 32%, condoms (21%), male sterilization (15%), and female

Highlights

- Dual protection – correct and consistent use of condoms in conjunction with another method of contraception – should be practiced to prevent HIV/STI transmission and unwanted pregnancies.
- A wide range of contraceptive choices should be made available to women to promote consistent usage of contraceptives.
- Hormonal contraceptives have not been found to be associated with either acquisition of HIV or HIV disease progression, and their use appears to be safe in HIV-positive women.
- Integrative care, combining HIV treatment with family planning counselling and services, increases contraceptive use among WHA.

sterilization (8%). Copper-bearing intrauterine devices (IUDs) had the lowest prevalence of use at 1% (4). Nine percent of respondents used no contraception.

In a survey of world regions for use of low-dose combined (progestin and estrogen) OCs, condoms, injectable depot-medroxyprogesterone acetate (DMPA), IUDs, and female and male sterilization, nearly every region provided a moderate level of access to OCs (68%), condoms (76%), DMPA (56%), and IUDs (50%). Female sterilization ranged from 20%–51% and was the most widely used method of contraception in developing countries (5, 6). Male sterilization was lower, from below 3% (6) in one study to 11%–39% in another (5).

Researchers have found that WHA used condoms more frequently than HIV-negative women (7, 8). Eighty-four percent of Parisian HIV discordant couples in one study used condoms alone and 12% used dual methods (condoms and OCs or IUDs). Condom use, as the only form of contraception used, was six times less likely among HIV concordant couples compared to discordant couples (8). Motivation to use condoms has been shown to be lower for individuals who are in long-term relationships, desire "closeness," have an abusive partner, use drugs, or believe that condoms inhibit pleasure (9).

The effectiveness of contraceptive methods in preventing unplanned pregnancy is dependent on how consistently and correctly they are used.

What are the Failure Rates of Contraceptives?

The effectiveness of contraceptive methods in preventing unplanned pregnancy is dependent on how consistently and correctly they are used (2). Users who are more experienced with a method use it more consistently and correctly. Male condom failure rate is 1%–15%. The failure rate of female condoms is 5%–21%. OCs have a failure rate of 0.3% when used consistently and 8% when used typically. DMPA has a failure rate of 0.3%–3%. The levonorgestrel-releasing intrauterine system (LNG-IUS) is highly effective with a failure rate of 0.2%, and the IUD failure rate is 0.8%. The cervical cap has a failure rate of 26%–32%, and the failure rate of the diaphragm is 6%–16%. Male sterilization has a failure rate of 1:2000 compared to 1:200 for female sterilization (2, 7).

Are Diaphragms and Cervical Caps Recommended?

The WHO does not usually recommend diaphragms and cervical caps for WHA and women at high risk of HIV because they are used with spermicides containing nonoxynol-9 (N-9) (2). N-9 may cause epithelial damage with frequent use and may increase the risk of HIV or STIs (7). A few studies evaluated the effectiveness of the combination of the diaphragm and male condom compared to male condom use alone. In a 2007 randomized controlled trial (RCT) from Zimbabwe, 158 of the 2472 HIV-negative women using both diaphragms and male condoms seroconverted, whereas 151 of the 2476 using male condoms only seroconverted over a two year period (10). The researchers concluded that due to lower condom use among diaphragm users (condom use in the intervention was 54% compared to 85% in the control group, [$p<0.0001$]), the diaphragm was not recommended as an effective HIV prevention technology. The same trial evaluated the incidence of chlamydial and gonococcal infections among 5045 sexually-active women at risk of HIV/STIs. Again, the researchers found no difference by study arm in the rate of STI acquisition (11). Although these barrier methods do not appear to be as effective as male condoms alone at preventing HIV infection, they are acceptable methods to prevent pregnancy if they are the only methods available.

Are OCs and DMPA Associated with Increased HIV Transmission?

Whether OCs and DMPA are associated with increased risk of HIV acquisition is an unresolved public health issue among researchers. Of 14 prospective studies examining OC use and HIV acquisition, three found a statistically significant increased risk (12–14), and 11 found no association (15–25). Of the 11 studies which reported non-significant findings, three showed estimates for the effect of OC use on HIV acquisition of at least 1.8 (trend towards harmful) (15, 20, 21), and two others reported estimates for OC use of 0.5 or lower (trend towards protective) (18, 19).

Ten prospective studies were found that examined HIV transmission risk and DMPA use; of these, four found a statistically significant increased risk (13, 19, 26, 27), one found a non-significant but raised risk (28), and five found no association (21–23, 25, 29). Two studies reported an increased risk of HIV infection only in subgroups differing in age and herpes simplex virus status (24, 28). The only retrospective study found of HIV-positive women using DMPA reported no statistical association between STI acquisition and DMPA use (30).

The studies that reported a significantly increased risk between HIV and hormonal contraception (both OCs and DMPA) involved high-risk groups such as sex workers (12, 13) or women attending STI clinics (14,19), as opposed to the "no association" findings in studies which involved the general population.

The methodological quality of these studies is highly variable, and caution is advised when analysing their results. Two reviews on this topic were recently published in 2009, and they both concluded that more study is needed before making any recommendations (31, 32). In a 2009 review, Hel et al recommended that new studies should involve large numbers of subjects at high risk of HIV, employ randomized, controlled, and safe administration of defined doses of contraceptives, and control for other confounding factors such as genital infections (32). At present however, WHO recommends the use of OCs and DMPA for WHA or women at risk of HIV (2).

Do OC or DMPA affect HIV Disease Progression?

Various studies have evaluated the possible association between OCs or DMPA and HIV disease progression. An RCT of 599 postpartum WHA in Zambia who received either an IUD or hormonal contraception for two years reported that clinical disease progression was more common in WHA who used hormonal contraception (13.2/100 woman-years) than in those who used the IUD (8.6/100 woman-years) (33). In a continuing study where Kenyan sex workers were prospectively followed, it was shown that greater viral diversity in early HIV infection could be a mechanism by which DMPA affects viral load and disease progression (34, 35). Women using DMPA at the time of HIV infection had significantly higher median viral set points and had acquired more diverse viral genotypes than women using no hormonal contraception at the time of HIV infection. This difference persisted during follow-up (median 34 months), but continuing use of DMPA did not appear to further increase viral load, and use of OCs was not associated with higher viral set points (34). A study by the same authors of a subset of participants (156 HIV-positive sex workers, 82 of whom were on hormonal contraception) showed that individuals who used either OCs or DMPA had acquired diverse virus strains, significantly higher viral loads, and significantly lower CD4 cell counts 4 to 24 months after infection, compared to those not on hormonal contraception (35). Furthermore, a 2007 RCT showed that use of DMPA or OCs was associated with more rapid disease progression, accelerated decrease in CD4 cells and increased mortality rate (33, 36).

In contrast, other studies have shown no association between hormonal contraception and HIV disease progression (37-40). A large 2009 multi-country cohort analysis, which included 4109 eligible women and a median follow-up time of 379 days, found that neither DMPA nor OCs were associated with HIV disease progression (40). A study of newly HIV-positive women in Uganda and Zimbabwe found that OC use was not significantly associated with a higher viral load (38). In another study of postpartum WHA, hormonal contraception was not associated with increased viral load or CD4 decline (39). In a study of 460 urban (15–35 years) WHA in Rwanda, OC and DMPA use remained significantly and independently borderline predictive of a low mortality rate although viral load and CD4 cell counts were not recorded (41). While definitive findings are still lacking, the WHO currently recommends the use of hormonal contraceptives for WHA (2).

Of note, hormonal contraception may interact with some antiretroviral medications, potentially affecting CD4 counts and viral loads detrimentally (42). Thus women should be prescribed a contraceptive that is compatible with their antiretroviral regimen.

Are Intrauterine Devices Safe for HIV-positive Women?

Intrauterine devices (IUDs) are another means of contraception. Their effectiveness and ease of use, combined with an improved efficacy period (5 years) that reduces the risks of complications due to insertion, make the IUD a good contraceptive alternative. IUD use among WHA has not been shown to be associated with increased risk of transmission to sexual partners (2, 43). In 2004, WHO revised its recommendations and promoted broader use of the intrauterine devices by WHA. Complication rates of IUDs were similar among HIV-positive and uninfected users (43, 44). In a Kenyan prospective study of 156 HIV-positive and 493 HIV-negative women, rates of pelvic inflammatory disease (PID) were similar (44). The risk of PID was most common within the first 20 days after insert, after which the risk of PID was considerably reduced (1.6 per 1000 women years), except in the presence of an STI such as Chlamydia trachomatis. Furthermore, the use of IUDs was not associated with an increase of HIV transmission (7). The use of condoms in conjunction with IUDs is recommended, as the use of IUD alone does not provide protection against HIV/STIs. Moreover, the levonorgestrel-releasing intrauterine system may be preferable to the IUD, whether used alone or as a component of dual protection, because it reduces menstrual bleeding, risk of anemia, and contraceptive failure rate (7, 45).

Condoms are the only method that can protect against both pregnancy and HIV/STI.

Does Male and Female Sterilization Decrease HIV Transmission?

A Thai study has suggested that vasectomy does not decrease the risk of HIV transmission to female partners since semen devoid of sperm can still contain high levels of HIV virus (46). A separate study of 367 African-American WHA found that few participants opted for sterilization as a means of contraception after antiretroviral therapy was made available. Moreover, during the same study period, use of the condom and DMPA increased (47). Two studies showed a reduction in consistent condom use in couples after one partner had undergone sterilization (48,49). Condom use is recommended for HIV/STI protection in men and women who are sterilized.

What are the Benefits of Dual Protection?

Dual protection involves the simultaneous use of a contraceptive and a condom. Condoms are the only method that can protect against both pregnancy and HIV/STI. Condoms also increase the contraceptive effectiveness of other methods (7, 45). Although male condoms are the most commonly used, the female condom can also be used for dual protection. In addition to female condoms, microbicides are another potential means of contraception and HIV prevention although not all microbicides confer contraceptive properties. At the time of this writing, no microbicide has proceeded beyond phase III clinical trials (50).

In a U.S. study of 360 family planning clients, 12% used dual protection to prevent HIV/STI (51). Another U.S. study found that 39% of women used dual protection (HIV-positive, 179; HIV-negative, 182) and 30% used condoms only (52). As compared with condom-only users, dual users were not significantly more likely to be HIV-positive. A dual method RCT conducted in Zambia with HIV discordant couples (92%; N = 251) found a three-fold higher uptake of contraceptives compared to the control (53). Study subjects in the "dual method" treatment group received direct contraceptive counselling and were offered a wide range of contraceptives compared to the control arm. Condom use was consistent, suggesting that contraceptives were not replacing condoms.

Does the Integration of Family Planning, HIV Prevention, and Counselling Services Increase Contraceptive Uptake?

Services that provide women and couples integrated HIV prevention, family planning (FP) and contraception counselling are becoming more accepted among policy-makers and researchers. A 2009 review on contraceptive uptake among HIV prevention and FP programs found that, of four studies prior to 2008 which met pre-set criteria, two showed a positive effect and two found mixed results (54). The two studies with positive effects were as follows: (a) Rwandan women receiving HIV counselling and testing and family planning counselling increased their hormonal contraceptive use from 16% at baseline to 24% at 5-month post-intervention (55); and (b) Tanzanian women in post-abortion care receiving HIV testing and FP counselling increased hormonal contraceptive use from 27% before to 52% after the intervention (56). A multipronged intervention in Kenya that included family planning counselling sessions and free contraceptives to couples on-site, found an increase in non-barrier contraceptive use from 31% to 65% among WHA, and from 29% to 47% among HIV-negative women (57). A study of WHA who attended two urban clinics in Rwanda, showed that when women were offered contraceptives (implants or IUDs) on-site instead of being referred to another family planning clinic for contraceptive methods, the on-site users were significantly more likely to take the implants (58). The two latter Kenyan/Rwandan studies showed that direct access to contraceptives on-site increases the likelihood of contraceptive uptake.

A study by Prata, Sreenivas and Bellows looked at the efficacy of combined or separate FP and HIV prevention services of Zimbabwe and Mozambique. Compared to Mozambique, Zimbabwe's more separate vertically driven FP program and their moderately strong HIV prevention program have not seen an increase in condom use to the level desired. Mozambique, however, has a much weaker FP program, but due to its integration with their strong HIV prevention program, the level of condom use is showing a significant increase (59).

Among Ugandan WHA, who had attended an HIV clinic and used contraceptive methods in the previous three months, WHA receiving antiretroviral therapy were more than twice as likely as counterparts not on antiretroviral treatment to use contraceptive methods (60). WHA using antiretrovirals were also more than three times as likely to use condoms as women not on antiretroviral therapy. The results of this study were statistically significant. This study demonstrates that integrative care, combining HIV treatment with family planning counselling and services, is a model for increased contraceptive use among WHA who attend clinics. Finally, a mathematical modelling analysis found that FP use would contribute just as much or more than antiretroviral prophylaxis to the prevention of mother-to-child transmission in mitigating the burden of pediatric HIV disease due to unwanted pregnancies (61).

Research Gaps

Many HIV/contraceptive studies, including some of those presented above, are based in developing country settings and may not be transferable to the Canadian setting. Many facilities, both rural and urban, have a limited variety of contraceptive methods to offer WHA. More rigorous studies are needed regarding the association between hormonal contraceptives and HIV communicability and disease progression. There is a lack of information on the best mode of service delivery to WHA (i.e. physicians, stand alone clinics) in Canada and on contraception issues pertaining to the most vulnerable WHA (e.g. First Nations, injection drug users, adolescents, and immigrants from HIV-endemic countries).

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