

Vaginal Douching: Evidence for Risks or Benefits to Women's Health

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Abbreviations: CI, confidence interval; OR, odds ratio; RR, risk ratio.

INTRODUCTION

Vaginal douching is the process of intravaginal cleansing with a liquid solution. Douching is used for personal hygiene or aesthetic reasons, for preventing or treating an infection (1), to cleanse after menstruation or sex, and to prevent pregnancy (2). For at least 100 years, there have been conflicting views on the benefits or harm in douching. Although there is a broad consensus that douching should be avoided during pregnancy, there is less agreement regarding douching for hygiene and relief of vaginitis symptoms. Two earlier reviews of douching data in women (3) and adolescents (4) have concluded that douching is harmful and should be discouraged because of its association with pelvic inflammatory disease, ectopic pregnancy, and perhaps other conditions. Nonetheless, douching continues to be a common practice. We seek to review the evidence of the impact of douching on women's health.

METHODS

Studies included in this review were identified via a search of the computerized MEDLINE database from 1965 through March 2002. Only English-language articles were included, as were a few relevant articles published before 1965. Major medical and nursing organizations were contacted for their policy and educational documents. Via a Freedom of Information request, we secured a summary of the Nonprescription Drug Advisory Committee meeting held on April 15, 1997, from the US Food and Drug Administration.

EPIDEMIOLOGY OF DOUCHING

Douching products (table 1), methods, frequency, motivation, and timing can vary considerably among women who douche. The prevalence of douching has decreased since 1988, but it is still a common practice among American

women, especially adolescents, African-American women, and Hispanic women (table 2) (1, 5). In 1995, 55 percent of non-Hispanic Black women, 33 percent of Hispanic women, and 21 percent of non-Hispanic White women reported "regular" douching (5). In the United States, there have been reports of 52–69 percent of adolescents douching at least once and one study documenting 56 percent reporting douching one or more times a week (2, 6–8). In addition, douching is prevalent in some African countries, such as Côte d'Ivoire, where the douching rate among women has been reported to exceed 97 percent (9). It is uncommon for women to douche daily; sporadic douching is more common (1, 8). A dose-response relation between douching and its adverse effects has been found by some, highlighting the importance of assessing douching frequency in any related research (10–14). The intensity and method of douching, especially douching with pressure, have been associated with adverse outcomes (15).

The timing of douching may impact on adverse sequelae, such as the temporal use of douching in relation to sexual activity, pregnancy, symptoms, and the menstrual cycle (4, 11, 16, 17). During ovulation, the levels of circulating estrogens increase, the cervical os opens, and the cervical mucus becomes clearer and more profuse (3, 18). Therefore, the risk of ascending infection from the pressure of douching may be greatest around the time of ovulation when the cervical os is gaping and the mucus is thin (3).

Women who douche consider it to be a healthy practice and often state that hygiene is their primary reason for douching (2, 6, 8, 15, 19). Some women state that douching is "necessary for good hygiene" (19). Motives for douching are many: to cleanse the vagina after menses or before or after sexual intercourse, to prevent or ameliorate an odor, to prevent or treat vaginal symptoms such as itching and discharge, and, less commonly, to prevent pregnancy or sexually transmitted diseases (2). Most women report

TABLE 1. Some vaginal douching products*

Ingredients	Function	Commercial	Home preparation
5% acetic acid (vinegar)	Acidifying agent	X	X
Benzoic acid, citric acid, lactic acid, sorbic acid	Acidifying agents	X	
Bleach (sodium hypochlorite and sodium hydroxide)	Cleanser		X
Cetylpyridinium chloride	Antimicrobial, antiseptic, germicidal, surfactant	X	
Decyl glucoside	Nonionic detergent, mild surfactant, solubilizes water-insoluble materials	X	
Diazolidinyl urea	Acidifying agent	X	
Disodium EDTA,† edetate† disodium	Preservative, antibacterial agent, metal chelator (binds magnesium and calcium)	X	
Lysol (alkyl 50% C ₁₄ , 40% C ₁₂ , 10% C ₁₆ , dimethylbenzyl-ammonium chloride 2.7%; Reckitt & Coleman, Wayne, NJ)	Cleanser		X
Octoxynol-9	Surfactant, produces a mucolytic or proteolytic effect, spermicide	X	
Povidone-iodine‡	Antimicrobial	X	
SD Alcohol 40†	Liquid vehicle	X	
Sodium benzoate	Preservative (prevents bacteria from growing in solution that contains citrate and lactate)	X	
Sodium bicarbonate (baking soda)	Alkalizing agent	X	X
Sodium citrate	Acidifying agent	X	
Sodium lactate	Acidifying agent	X	
Water	Liquid vehicle, cleansing	X	X
Yogurt	Potential source of nonhuman strain of lactobacillus		X

* Sources: *Handbook of Nonprescription Drugs*. Washington, DC: American Pharmaceutical Association and the National Professional Society of Pharmacists, 1982; and Dr. Dennis Pillion, Pharmacology Department, University of Alabama at Birmingham, personal communication, 2001.

† EDTA, ethylenediaminetetraacetic acid; edetate, ethylenediaminetetraacetate; SD Alcohol 40, specially denatured alcohol, followed by a number or a number-letter combination that indicates how the alcohol was denatured, according to the formulary of the US Bureau of Alcohol, Tobacco, and Firearms.

‡ Medicated douches.

douching for hygienic reasons, while douching due to symptoms may be comparatively uncommon (20, 21). Outside influences such as physicians, mothers, girlfriends, boyfriends, and the media affect a woman's decision to douche (19). The motivation for douching is a complicated issue imbued with both psychologic and social features that need to be addressed if vaginal douching behavior is likely to be modified on any large scale.

HEALTH EFFECTS OF DOUCHING

Douching has been associated with many adverse outcomes including pelvic inflammatory disease, bacterial vaginosis, cervical cancer, low birth weight, preterm birth, human immunodeficiency virus transmission, sexually transmitted diseases, ectopic pregnancy, recurrent vulvovaginal candidiasis, and infertility. Studies conflict, however, and the strength of association varies enormously between studies. Many potentially confounding factors blur the

epidemiologic assessment of the consequences of douching. Douching in the United States is more common among African-American women (1, 3, 5, 19). Independently of race, associations between douching and poverty, less than a high school education, a history of pelvic inflammatory disease, and having between two and nine lifetime sexual partners are reported (1). A lower educational level, many sexual partners, and poverty are also risk factors for sexually transmitted diseases and bacterial vaginosis, making it especially complicated to assess causality since women might douche secondary to infection-related symptoms rather than for routine purposes.

Conflicting results are reported regarding sexually transmitted infections and douching. Some studies suggest that adolescents who douche are more likely to have a history of a sexually transmitted disease (1, 15), while other studies have found that women who have a history of a sexually transmitted disease were less likely to douche (1, 10, 22). Prospective studies are needed to assess whether douching is

TABLE 2. Percentage of women who douche regularly, by age and race/ethnicity, according to the National Survey of Family Growth, United States

Year and reference	Sample size (no.)	Age (years)	Total (%)	Non-Hispanic Black (%)	Non-Hispanic White (%)	Hispanic (%)
NSFG,* 1995 (5)	10,847	15–44	26.9	55.3	20.8	33.4
		15–19	15.5	36.8	10.8	16.4
		20–24	27.8	60.4	20.4	32.5
		25–29	30.0	58.7	23.9	38.0
		30–34	30.6	60.4	24.5	35.1
		35–39	28.9	62.5	21.9	41.2
		40–44	26.9	53.1	21.1	38.5
NSFG, 1988 (1)	8,450		All races (%)	Black (%)	White (%)	
		15–44	36.7	66.5	32.0	
		15–19	31.0	53.5	25.4	
		20–24	41.1	63.1	35.7	
		25–29	37.6	67.6	32.9	
		30–34	36.0	64.8	31.5	
		35–39	35.1	70.2	30.2	
		40–44	37.0	65.8	33.8	

* NSFG, National Survey of Family Growth.

causally related to sexually transmitted diseases or if douching is most commonly a response to symptomatic vaginitis. Whether complications like pelvic inflammatory disease might have occurred even without douching can be answered with prospective studies (1, 23, 24).

PHYSIOLOGY

There are several ways by which douching may contribute to disease. Douching may remove normal vaginal flora, permitting the overgrowth of pathogens. It may also provide a pressurized fluid vehicle for pathogen transport, helping lower genital tract infections ascend above the cervix into the uterus, fallopian tubes, or abdominal cavity (3, 16). These microbiologic and physical mechanisms may work in concert. Ness et al. (25) found that, among a group of women with clinical pelvic inflammatory disease, frequent and recent douching was associated with endometritis and upper genital tract infection in women with normal or intermediate vaginal flora, although this was not noted in women with bacterial vaginosis.

An added concern is that, if douching reduces the density of normal vaginal flora, bacterial vaginosis might develop or there may be a predisposition to colonization by such sexually transmitted pathogens as *Neisseria gonorrhoeae* or *Chlamydia trachomatis*, filling the “ecologic niche” (16). Pathogenic bacteria may then ascend into the upper reproductive tract, leading to inflammatory scarring (endometritis, salpingitis, or peritonitis), the principal cause of ectopic pregnancy, early miscarriage, and infertility (16).

Physiologic risk for sexually transmitted diseases is greater among adolescent women, since they typically have ectopic columnar epithelial cells in the exocervix with a large transformation zone that is vulnerable to bacterial and

viral sexually transmitted infections (26). Some argue that it is especially important to caution adolescents about the potential adverse effects of douching, as they may be even more susceptible to its adverse consequences (4).

DOUCHING AND VAGINAL ECOLOGY

A healthy menarcheal vaginal environment is composed primarily of lactobacilli (27). Hydrogen peroxide (H_2O_2)-producing lactobacilli may protect the vagina against the overgrowth of potentially pathogenic indigenous flora and exogenous pathogens. Selected human strains of lactobacilli produce lactic acid that helps keep the vaginal pH low, usually less than 4.5, which is inhospitable to many pathogenic organisms (28). In addition to H_2O_2 production, lactobacilli adhere to epithelial cells, block pathogen adhesion, and stimulate the mucosal immune system (28).

Newton et al. (29) found that douching more than once per month was associated with the presence of *Trichomonas vaginalis* (odds ratio (OR) = 3.5, $p = 0.02$) and that douching one or more times a month was associated with *Gardnerella vaginalis* (OR = 2.4, $p = 0.05$). They examined Mexican-American and African-American women and concluded that race (specifically, being African American) had a more consistent association with the presence or absence of a cervical-vaginal organism than other factors, including behavioral variables.

Different types of douching liquids have various antimicrobial effects. Pavlova and Tao (30) used in vitro studies to show that four antiseptic douches were inhibitory against all vaginal microorganisms, including lactobacilli. Three vinegar-containing douches selectively inhibited vaginal pathogens associated with bacterial vaginosis, group B streptococcal vaginitis, and candidiasis, but not lactobacilli,

suggesting to the investigators that vinegar (5 percent acetic acid) douches may be less harmful or may be beneficial. Juliano et al. (31) tested seven commercial vaginal antiseptic douche solutions against vaginal lactobacilli and found marked in vitro antibacterial activity, often after very short exposure times. Thus, some douche preparations may cause substantial changes in vaginal flora.

Onderdonk et al. (32) found that healthy women who douched with a 4 percent acetic acid solution experienced a transient reduction of total bacteria that they attributed to the physical washing of the vaginal vault alone. However, when they used povidone-iodine, a bactericidal agent, it caused a significant reduction in total bacterial counts that suggested an antiseptic effect in addition to the washing effect. They concluded that, in some individuals, douching may decrease the vaginal bacteria that are present, allowing a rapid proliferation of potential pathogens, increasing the risk of associated infections. In contrast, Monif et al. (33) found that, while in vivo douching with povidone-iodine caused a dramatic decrease in the total number of vaginal bacteria, baseline counts were reestablished within 120 minutes. They also found that lactobacilli were the first bacteria to recover. As a consequence, Monif (34) has argued for the potential benefits of douching. However, these experiments do not reflect that some women may participate in a behavior that alters the vaginal ecology before it has a chance to return to normal, such as repeated douching or vaginal or receptive vaginal, oral, or anal sex. The weight of the epidemiologic evidence suggests that repeated douching with its attendant washing and antibacterial effects will diminish lactobacilli predominance and risk reproductive tract infections.

BACTERIAL VAGINOSIS

Bacterial vaginosis is a common cause of malodorous vaginal discharge in women (35). Three million symptomatic cases are reported annually in the United States, but millions more remain unreported or unrecognized (28, 36). A clinical diagnosis of bacterial vaginosis requires three of the following "Amsel criteria": vaginal pH of greater than 4.5, a positive "whiff" test for amines, presence of clue cells, and a thin homogenous discharge (37). In women with bacterial vaginosis, lactobacilli, especially H_2O_2 -producing lactobacilli, are greatly decreased and the vagina becomes overgrown with anaerobic and facultatively anaerobic bacteria that are often present in small numbers in the normal vagina. These include *G. vaginalis*, *Mycoplasma hominis*, *Prevotella* spp., *Peptostreptococcus* spp., *Mobiluncus* spp., and *Bacteroides* spp. (28, 38–40). Bacterial vaginosis has been reported to be twice as common among African-American and Afro-Caribbean women than among White women (35, 41–44). Vaginal douching is also twice as common among African-American women. It has been proposed that bacterial vaginosis is sometimes sexually transmitted; however, no male factor has been identified, and bacterial vaginosis can occur in adolescent women who have never had sexual intercourse (45).

Bacterial vaginosis is common, and many factors reminiscent of sexually transmitted disease risk are associated with bacterial vaginosis. Schwebke et al. (46) found that 78

percent of women without evidence of genital tract infection had significant, although transient, changes in their vaginal flora. Day-to-day variability was defined as less than 85 percent of a given woman's normal vaginal flora, which was calculated on data from self-obtained vaginal smears from each woman. In a multivariable analysis, more frequent episodes of receptive oral sex were associated with unstable flora. Day-to-day variability in vaginal flora was associated with the use of vaginal medication, menses, greater number of sexual partners, spermicide use, more frequent vaginal intercourse, and less frequent use of condoms. Many of these factors are also associated epidemiologically with bacterial vaginosis and sexually transmitted diseases. It has also been reported that intrauterine device users are more likely to be diagnosed with bacterial vaginosis than are nonusers (47).

Bacterial vaginosis has been linked with several adverse reproductive outcomes, including endometritis (48–51), spontaneous preterm delivery (52–61), preterm delivery of low birth weight infants (62), low birth weight (13), premature rupture of the membranes (52, 55), histologic chorioamnionitis (63), and infection of amniotic fluid (64–66). In a randomized clinical trial, Hauth et al. (67) studied pregnant women with bacterial vaginosis who also had a high risk for preterm delivery. Antepartum metronidazole and erythromycin lowered the frequency of prematurity. However, two other studies found that vaginal clindamycin for treatment of bacterial vaginosis did not decrease the rate of preterm deliveries (68, 69). The frequency of vaginal douching was shown by Fiscella et al. (13) to have a dose-response relation with the likelihood of low birth weight. If a pregnant woman has bacterial vaginosis and douches, chronic bacterial colonization of the endometrium and/or chorioamnion may cause preterm rupture of the membranes and/or preterm labor (70). Meis et al. (60) found that the presence of bacterial vaginosis at 28 weeks' gestation is associated with an increased risk of spontaneous preterm birth, defined as birth at less than 35 weeks. This association is strongest for early preterm birth and may be mediated by subclinical chorioamnionitis (71).

Douching is associated with bacterial vaginosis, although the direction of causation is uncertain: Does douching predispose to bacterial vaginosis, or do women douche in response to bacterial vaginosis symptoms? In a cross-sectional study, Holzman et al. (72) found that vaginal douching within the past 2 months was associated with an increased prevalence of bacterial vaginosis (OR = 2.9, 95 percent confidence interval (CI): 1.5, 5.6). Fonck et al. (73) found that, in female sex workers in Nairobi, Kenya, douching in general and douching with soap and water were both significantly associated with bacterial vaginosis, with a significant trend for increased frequency of douching and higher prevalence of bacterial vaginosis. In an important recent prospective cohort study, Royce et al. (74) found that douching was associated with bacterial vaginosis (risk ratio (RR) = 1.8, 95 percent CI: 1.7, 2.0) and preterm birth (RR = 1.6, 95 percent CI: 1.1, 2.1). Rajamanoharan et al. (35) found that bacterial vaginosis was strongly associated with the use of commercial antiseptic products applied to the vulval mucosa or as a vaginal douche. After controlling for genital hygiene behaviors (such as douching and vulval antiseptics) and history of previous bacterial vaginosis episodes, they

found that there were no ethnic differences between women with bacterial vaginosis and women without bacterial vaginosis. Hawes et al. (44) found that lack of vaginal H₂O₂-producing lactobacilli was independently associated with bacterial vaginosis but not with vulvovaginal candidiasis. They also reported that acquisition of bacterial vaginosis was associated with having a new sexual partner and douching for hygiene. Stevens-Simon et al. (75) found that Black adolescents had a more alkaline vaginal pH than did White adolescents, possibly decreasing their resistance to common vaginal infections, such as trichomoniasis and bacterial vaginosis.

Given the frequency of bacterial vaginosis among American women and its associations with adverse reproductive outcomes, the largest attributable risk for which douching may be responsible may be increased bacterial vaginosis frequency. However, the temporal relation has not been well established given the paucity of large, prospective studies.

GONORRHEA, CHLAMYDIA, AND OTHER SEXUALLY TRANSMITTED DISEASES

Many sexually transmitted diseases are asymptomatic and therefore go undiagnosed, particularly in women. Two bacterial sexually transmitted diseases, gonorrhea and chlamydia, are especially important causes of pelvic inflammatory disease. Chlamydia has been associated with tubal infertility due to fallopian tube scarring and obstruction (76–80), ectopic pregnancy (81), and pelvic inflammatory disease (82). In addition, both chlamydia and gonorrhea have been reported to facilitate human immunodeficiency virus transmission (26). Several studies have found an association between douching and chlamydial infection (9, 14, 25, 83–85). However, cross-sectional studies cannot determine reliably whether the douching preceded the disease or if the symptoms led to the douching.

Scholes et al. (14) found that women who reported douching 12 months prior to their clinic visit were twice as likely to have cervical chlamydial infection and that, as the frequency of douching increased, the likelihood of chlamydial infection also increased. Peters et al. (83) found that douching at least monthly was significantly associated with chlamydia in adolescents. Beck-Sague et al. (84) found that, in adolescents who douched monthly or more frequently, there was a higher prevalence of chlamydia. Stergachis et al. (85) found that douching within the last year was independently predictive of chlamydial infection.

Other studies have examined sexually transmitted diseases in general. Foch et al. (7) found that, in adolescents attending a family planning clinic, those who reported douching were more likely to have a history of a sexually transmitted disease. Joesoef et al. (17) found that, among Indonesian pregnant women, douching with water and soap, betel leaf, or a commercial agent after sex was associated with having a sexually transmitted disease and that the association was strengthened among women who douched before sex or both before and after sex. Compared with women who never douched, those who always douched with betel leaf or a commercial agent had a substantially increased risk for sexually transmitted diseases (OR = 9.4, 95 percent CI: 1.8,

50.3). Douching with irritating substances may make the vaginal mucosa more susceptible to sexually transmitted diseases, analogous to the use of intravaginal herbs as drying agents (86). Critchlow et al. found that cervical ectopy, which has been associated with acquisition of certain sexually transmitted diseases, including chlamydia (87, 88) and human immunodeficiency virus (89), was less common among women with sexually transmitted diseases who douched recently (90). Douching and sexual activity both may accelerate squamous metaplasia and cervical maturation (91, 92). Cervical ectopy is common in adolescents and has been associated with increased risk of sexually transmitted disease acquisition, suggesting the importance of measuring all these factors together in studies of douching and health risk (87, 88, 91). Jacobson et al. (91) found that both douching and sexual activity may decrease ectopy in adolescents. If women who douche have less ectopy, they might eventually have a theoretically *lower* chance to acquire sexually transmitted diseases, although there are no data that suggest this. In contrast to the above studies, Fonck et al. (73) found that, in female sex workers in Nairobi, Kenya, there was no direct relation between douching and the risk for human immunodeficiency virus infection or other sexually transmitted infections. Similarly, Moscicki et al. (92) found no ectopy association with human immunodeficiency virus among US adolescents.

Given the severity of the reproductive consequences of gonorrhea and chlamydia, the associations with douching are worrisome, particularly for chlamydia. As with bacterial vaginosis, the temporal relation is clouded by the paucity of prospective data, hindering clarification of whether douching is a cause or a consequence.

PELVIC INFLAMMATORY DISEASE

Pelvic inflammatory disease is a polymicrobial infection primarily initiated by ascending infection to the upper reproductive tract by *N. gonorrhoeae*, *C. trachomatis*, or anaerobic and/or facultative bacteria also occurring with bacterial vaginosis (93–96). It is virtually certain that the physical pressure of douching can facilitate ascension of pathogens (23). Infection, inflammation, and scarring of the fallopian tubes, ovaries, and/or the uterine lining can result in tubal infertility, tuboovarian abscess, endometritis, chronic pelvic pain, recurrent pelvic inflammatory disease, and ectopic pregnancy. Pelvic inflammatory disease affects over 1 million American women and adolescents annually at an estimated cost of \$4.2 billion in 1990 (94, 97). The total cost of pelvic inflammatory disease, including both direct and indirect costs, was projected to be more than \$9 billion in 2000 (97). It was estimated that 20–30 percent of women with pelvic inflammatory disease would be hospitalized (24) and that at least 25 percent would suffer one or more serious long-term sequelae (97). Guidelines for diagnosis from the Centers for Disease Control and Prevention include complaint of abdominal pain and clinical findings of lower abdominal, cervical motion, and adnexal tenderness (98). Silent pelvic inflammatory disease that goes unreported may account for 50 percent or more of all the cases of pelvic inflammatory disease (99).

Author(s)	Measured	Sample size
Zhang et al. (3)	Pooled	Meta-analysis*
Paisarntantiwong et al. (110)	Yes or no	24
Scholes et al. (104)	Within previous 3 months	131
Mueller et al. (111)	>2×/year	129
Wolner-Hanssen et al. (10)	Within previous 2 months	100

Author(s)	Frequency	Sample size
Zhang et al. (3)	≥1×/week	Meta-analysis*
Scholes et al. (104)	≥1×/week	131
Wolner-Hanssen et al. (10)	≥3×/month	100

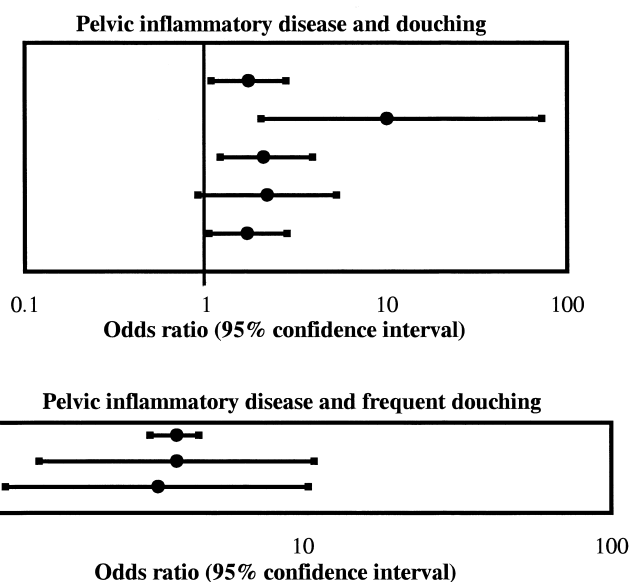


FIGURE 1. Pelvic inflammatory disease and douching. Top: This figure represents the odds ratio and 95% confidence interval from several studies that looked at pelvic inflammatory disease and douching. Bottom: This figure represents the odds ratio and 95% confidence interval from several studies that looked at pelvic inflammatory disease and various frequencies of douching. *, estimated $n = 231$ based on two studies (10, 104).

About 70 percent of the women diagnosed with pelvic inflammatory disease in the United States are under 25 years of age (100). Risk factors for pelvic inflammatory disease have been found to include being of lower socioeconomic status, non-White, less than 25 years of age, being exposed to a sexually transmitted disease or having a history of pelvic inflammatory disease, use of an intrauterine device, failure to use contraception, multiple sexual partners, and earlier sexual initiation (100, 101). Some of these same characteristics are prevalent among women who douche, and vaginal douching has been associated with pelvic inflammatory disease in most studies (3, 12, 22, 26, 102–107).

Vaginal douching may potentially increase the risk of pelvic inflammatory disease by promoting the ascension of lower genital tract infections to the upper genital tract, by changing the vaginal environment to increase susceptibility to reproductive tract infections that precede pelvic inflammatory disease, or by introducing nonpathogenic vaginal bacteria into the typically sterile upper genital tract (24). The weight of the evidence suggests a causal association of douching and pelvic inflammatory disease, but the lack of prospective studies continues to plague efforts to clarify the causal relation.

As early as 1952, an association between douching and pelvic inflammatory disease was suspected (108). Jossens et al. (106) found that douching after menses was a significant risk factor for pelvic inflammatory disease. Others report uncertainty (109) in the relation between douching and pelvic inflammatory disease or have found vaginal douching to be associated with pelvic inflammatory disease (107, 110) (figure 1) (3, 10, 95, 104, 106, 110, 111). Mueller et al. (111) found that women who douched had moderately elevated risks for overt and silent pelvic inflammatory disease-associ-

ated infertility. Scholes et al. (104) found that women who douched during the previous 3 months had an elevated odds ratio for pelvic inflammatory disease of 2.1 after controlling for other risk factors. They also found that there was a dose-response relation as women who douched more frequently had a higher pelvic inflammatory disease risk. In a case-control study, Wolner-Hanssen et al. (10) found that current douching was more common among women with pelvic inflammatory disease and that pelvic inflammatory disease was significantly related to frequency of douching. Neumann and DeCherney (102) found an association between pelvic inflammatory disease and vigorous and frequent (more than once a week) douching. Miller et al. (26) reported douching to have a significant impact on the risk of pelvic inflammatory disease. Forrest et al. (22) reviewed the literature through 1989 and concluded that the weight of published evidence supported an association between vaginal douching and both pelvic inflammatory disease and ectopic pregnancy. Zhang et al. (3) reported in a 1997 meta-analysis that douching increased the risk of pelvic inflammatory disease by 73 percent. Miller et al. (26) found that, from the 1995 National Survey of Family Growth, douching was significantly associated with having pelvic inflammatory disease. Aral et al. (103) analyzed data from the 1988 National Survey of Family Growth and found that almost 11 percent of American women had a history of treatment for pelvic inflammatory disease. They suggested that vaginal douching increased the risk of pelvic inflammatory disease by 50 percent among White and by 30 percent among African-American women.

Pelvic inflammatory disease is a prevalent problem worldwide as well as in the United States. Its serious reproductive outcomes and financial burdens are a major factor moti-

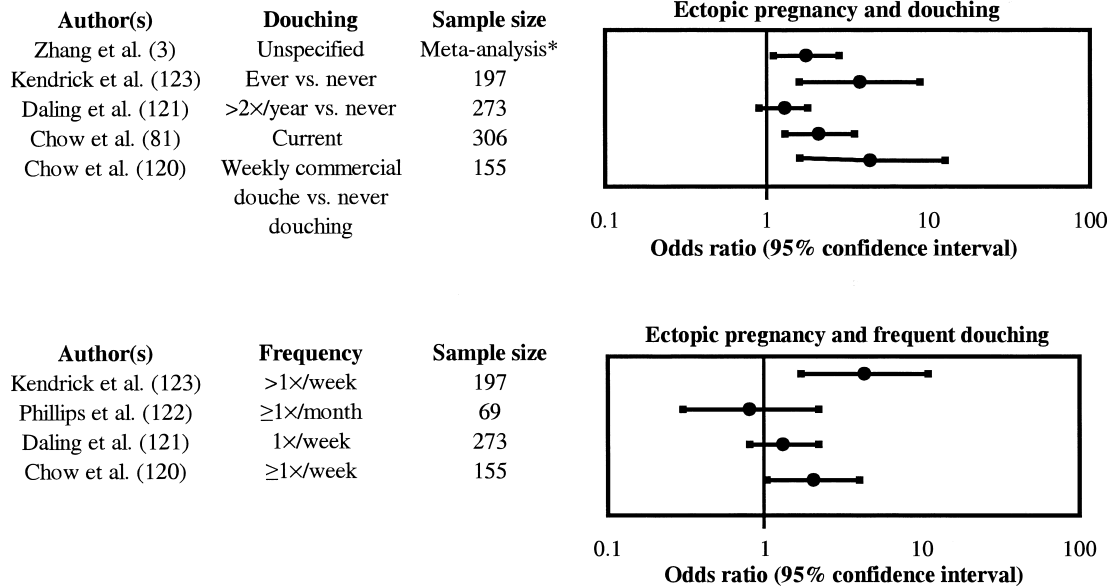


FIGURE 2. Ectopic pregnancy and douching. Top: This figure represents the odds ratio and 95% confidence interval from several studies that looked at ectopic pregnancy and douching. Bottom: This figure represents the odds ratio and 95% confidence interval from several studies that looked at ectopic pregnancy and various frequencies of douching. *, estimated $n = 1,000$ based on five studies (81, 120–123).

vating sexually transmitted disease control and prevention. The weight of the evidence suggests strongly an association between pelvic inflammatory disease and douching. This association may represent the strongest incentive for policies to discourage women from douching.

REDUCED FERTILITY, INFERTILITY, AND ECTOPIC PREGNANCY

Pelvic inflammatory disease is a common cause of reduced fecundity (fertility) and sterility (112, 113). In an analysis of the 1995 National Survey of Family Growth, it was found that women with a history of pelvic inflammatory disease were less likely to be fecund compared with women with no such history (26). The likelihood of infertility increases as the number and severity of pelvic inflammatory disease episodes increase (26). It has been reported that 20 percent of women who have one episode of pelvic inflammatory disease will be infertile (114) and that 50 percent of women who have three or more episodes of pelvic inflammatory disease will be infertile (115). Vaginal douching may reduce fecundity by increasing susceptibility to infection (11). Baird et al. (11) found that women who douched were 30 percent less likely to become pregnant each month compared with women who did not douche. This risk was greater for younger women than it was for older women.

Ectopic pregnancy is defined as implantation of a fertilized egg outside the uterine cavity (116). Women with a history of pelvic inflammatory disease were twice as likely to have had an ectopic pregnancy compared with sexually active women who had no history of pelvic inflammatory disease (26). Vaginal douching has been associated with ectopic pregnancy (117–119). Several studies reported that

vaginal douching increased the risk for ectopic pregnancy (figure 2) (3, 84, 120–123). Daling et al. (121) found that there was a small increase in risk of tubal pregnancy among women who douched more than two times per year in the past year ($RR = 1.3$, 95 percent CI: 0.9, 1.8). This risk was found to increase further if, in addition to douching more than two times per year, the women also had more than one sexual partner during their lifetime ($RR = 1.6$, 95 percent CI: 1.1, 2.3) or had previous exposure to chlamydia ($RR = 2.4$, 95 percent CI: 0.8, 7.3). Kendrick et al. (123) found that ectopic pregnancy risk among African-American women correlated with the number of years of douching at least once per month. They found that any douching carried some risk and that different douching strategies were associated with different levels of risk. In a case-control study that controlled for chlamydial exposure, J. M. Chow et al. (81) found that current douching was an independent risk factor for ectopic pregnancy. In a different study, W. H. Chow et al. (120) reported that the risk of tubal ectopic pregnancy for women who douched at least weekly was twice that of women who never douched. In a meta-analysis, Zhang et al. (3) found that frequent douching increased risk of ectopic pregnancy by 76 percent. In a meta-analysis of case-control and cohort studies done between 1978 and 1994, Ankum et al. (118) found only a slightly increased risk for ectopic pregnancy due to douching. However, in a case-control study of ectopic pregnancy with 69 cases and 101 controls, Phillips et al. (122) found that there was not a significant increase in the risk of ectopic pregnancy due to vaginal douching once or more per month ($OR = 0.8$, 95 percent CI: 0.3, 2.2).

Bacterial infections of the lower and upper genital tracts can result in pelvic inflammatory disease, which can, in turn, result in reduced fertility, infertility, and ectopic pregnancy.

Many studies have looked at ectopic pregnancy risk and douching, with the majority of evidence finding an association. The temporal relation here remains problematic with the dearth of prospective studies.

CERVICAL CANCER

Cervical cancer is among the most common cancers in women worldwide (124). The American Cancer Society estimates that, during 2001, about 12,900 cases of invasive cervical cancer would be diagnosed in the United States and that about 4,400 American women would die from cervical cancer (125). Cervical cancer was once one of the most common causes of cancer death for American women but now, due to early detection and treatment, it is far less so (125). Worldwide, cervical cancer is the second or third most common cancer among women and, in some developing countries, it is the most common women's cancer (126). Nearly all squamous cell cervical cancer cases are related to human papillomavirus, a sexually transmitted infection. The cause of cervical cancer has been postulated to be multifactorial, with other cofactors being required to cause cancer. Haverkos et al. (127) proposed that tar exposure through tar-based vaginal douching products may be one such cofactor, increasing the risk of invasive cervical cancer. Cervical cancer is twice as high among African-American women as among White women, as are douching rates.

A positive relation between the frequency of douching and cervical cancer risk was found in several studies (figure 3) (3, 128–134). Graham and Schotz (128) found that, as the frequency of douching increased, so did the risk of invasive cervical cancer and carcinoma in situ. Peters et al. (129) found that the “frequency-years” of douching contributed independently and significantly to the risk of invasive cervical cancer. In a meta-analysis, Zhang et al. (3) found that douching was modestly associated with cervical cancer, when they aggregated studies that looked at both invasive cervical cancer and carcinoma in situ together or at invasive cervical cancer alone (RR = 1.25, 95 percent CI: 0.99, 1.59). However, it is unclear whether this risk ratio refers to invasive cervical cancer or both carcinoma in situ and invasive cervical cancer combined. Zhang et al. reported that, among women who douched at least once a week, the pooled adjusted risk ratio was 1.86 (95 percent CI: 1.29, 2.68). In a population-based case-control study in Utah, Gardner et al. (132) looked at a combined study group of invasive cervical cancer (13 percent of the study group) and carcinoma in situ (87 percent of the study group) and found no association between cervical cancer and douching in women who douched once per week or less. However, in women who douched more than once a week, a positive association was found (OR = 4.7, 95 percent CI: 1.9, 11). They hypothesized that douching alters the vaginal chemical environment, making the cervix more susceptible to pathologic changes and subsequent cervical cancer.

In contrast, in a population-based case-control study in Costa Rica, Stone et al. (134) found that douching was not associated with carcinoma in situ or invasive cervical cancer. Herrero et al. (131), in a case-control study in Latin America, found no consistent association between vaginal douching

and invasive cervical cancer. In a case-control study, Brinton et al. (130) found inconsistent results related to the risk of vaginal douching and invasive cervical cancer. They found 30–40 percent nonsignificant elevations in invasive cervical cancer risk associated with regular douching of five or more times per month, but they also found that nonregular douchers were at a higher risk than were regular douchers and that there was no clear relation to the age of first douching or total months of use. They therefore hypothesized that the association they observed may just represent chance.

Cervical cancer is a common cancer in women. Studies on cervical cancer and douching do not show a clear association, with some studies showing a positive association, some a negative association, and some no association. Although cervical cancer would not generate symptoms that might motivate a woman to douche, it is more common among women with other sexually transmitted disease risk factors. For a definitive assessment of causality, a prospective determination would be needed, a difficult task for a chronic disease with a long latency period.

HUMAN IMMUNODEFICIENCY VIRUS

Sexually transmitted diseases and other genital tract infections have been implicated in the acquisition and transmission of human immunodeficiency virus (135–137). Vaginal flora abnormalities, including bacterial vaginosis and sexually transmitted diseases, have been found to be associated with human immunodeficiency virus infection (138–140). Normal vaginal acidity can partly inactivate human immunodeficiency virus, so if bacterial vaginosis raises the pH of vaginal fluid and recruits target inflammatory cells, women with bacterial vaginosis may be more susceptible to human immunodeficiency virus. H_2O_2 -producing lactobacilli have been shown to have viricidal effects on human immunodeficiency virus type 1 (141), and a low vaginal pH may reduce the number of human immunodeficiency virus type 1 target cells in the vagina (142). Helfgott et al. (143) found significant associations between human immunodeficiency virus and bacterial vaginosis, vulvovaginal candidiasis, and trichomonal vaginitis. In a study in Côte d'Ivoire, human immunodeficiency virus was found to be two times more frequent in women using intravaginal antiseptics (9). These cross-sectional studies could be confounded in that bacterial vaginosis, sexually transmitted diseases, and human immunodeficiency virus can be consequences of high risk sexual behavior, although several studies used logistic regression modeling to try to control for sexual behavior.

Not all douching products would be expected to carry comparable risks. Gresenguet et al. (86), in Bangui, Central African Republic, found that vaginal douching with noncommercial preparations was associated with an increased prevalence of human immunodeficiency virus, whereas douching with commercial antiseptic preparations was associated with a lower prevalence of this virus. However, the median years of education for women using commercial antiseptics was 8 years, compared with only 2 years for women using noncommercial preparations, so the results may be confounded by socioeconomic status. Tevi-

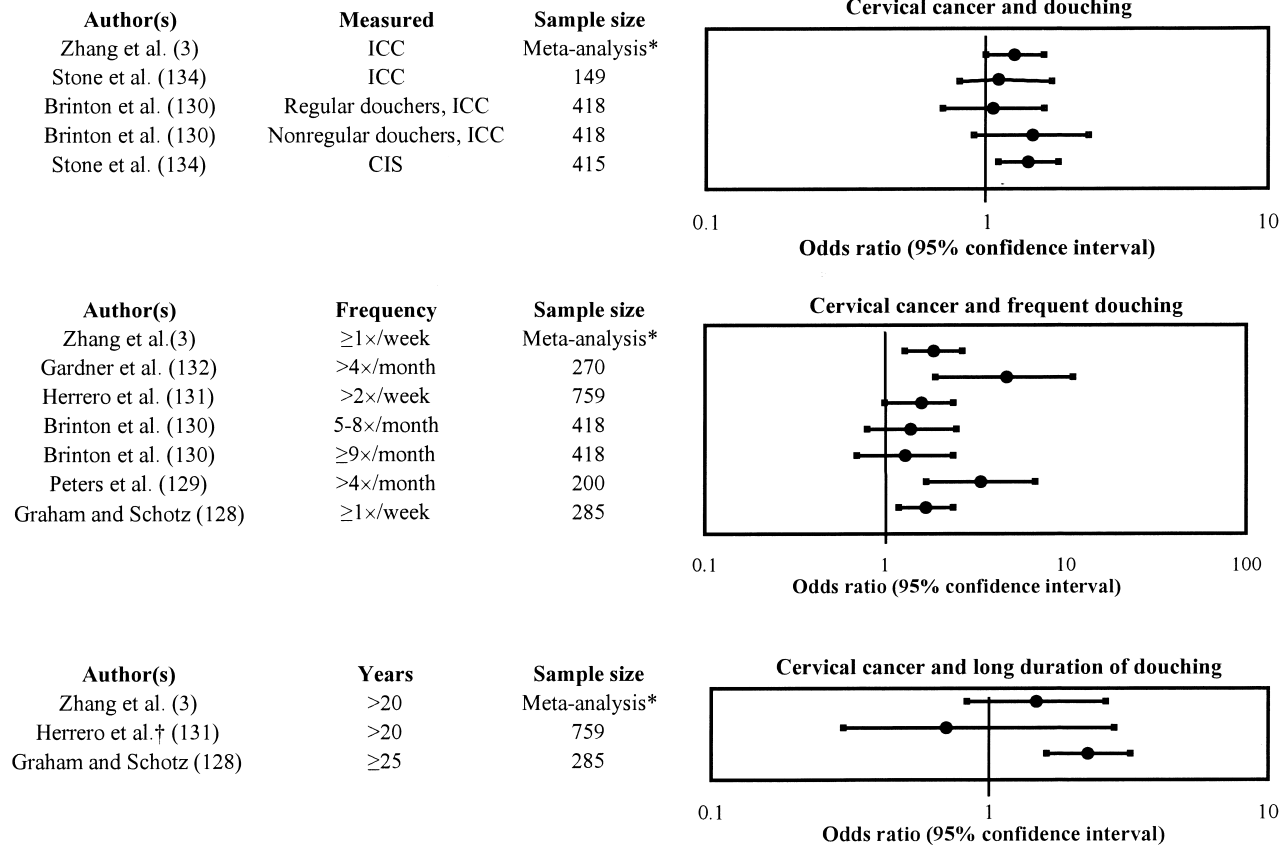


FIGURE 3. Cervical cancer and douching. Top: This figure represents the odds ratio and 95% confidence interval from several studies that looked at cervical cancer and douching. Middle: This figure represents the odds ratio and 95% confidence interval from several studies that looked at cervical cancer and various frequencies of douching. Bottom: This figure represents the odds ratio and 95% confidence interval from several studies that looked at cervical cancer and long durations of douching. CIS, carcinoma in situ; ICC, invasive cervical cancer. *, estimated $n = 2,081$ based on six studies (128–132, 134); †, error in original paper as to lower bound of 95% confidence interval: 0.8; our estimate of likely correct lower bound: 0.3.

Benissan et al. (144) reported that vaginal douching reduces semen load substantially after sexual intercourse, and they suggested douching as a supplementary means for prevention of heterosexual human immunodeficiency virus transmission. Given the associations of douching with bacterial vaginosis/sexually transmitted diseases, such a policy suggestion should be studied carefully as other data suggest douching to be harmful.

The relation among human immunodeficiency virus, bacterial vaginosis, and sexually transmitted diseases is complex, as all may be contributed to by high risk sexual behavior. Only a few cross-sectional studies have looked at human immunodeficiency virus and douching, suggesting concern that douching might be associated with risk for human immunodeficiency virus. Given the vast pool of women infected worldwide with human immunodeficiency virus, other sexually transmitted diseases, and bacterial vaginosis and the increased risk attributable to douching, education to discourage douching by women may have a huge impact on the risks of infections and reproductive health consequences.

DOUCHING FOR VAGINOSIS OR VAGINITIS

The near-universal medical view is that douching is not needed for routine vaginal hygiene (145). Monif (34) argues, however, that there is a role for douching among women with symptomatic vaginitis or vaginosis. Monif argues that douching is probably a behavioral response to an abnormal vaginal ecology, a factor not taken into account in cross-sectional studies, such that douching appears to be a cause when it is more likely to be a consequence. Monif (34) further argues that available microbiologic data indicate douching to be harmless. Separate studies by Monif et al. (33) and by Osborne and Wright (146) suggested a positive effect of douching, as in the case of using antibacterial douches to replace systemic antibiotics during vaginally related surgery. Monif et al. (33) found that a povidone-iodine douche produced a dramatic fall in the total bacteria in the vagina for the first 10 minutes following administration. Within 2 hours, near baseline counts were reestablished, suggesting a benign nature of single episode douching.

Three vinegar-containing douches tested by Pavlova and Tao (30) were selectively inhibitory against vaginal patho-

gens associated with bacterial vaginosis, group B streptococcal vaginitis, and candidiasis, but not lactobacilli, giving a preliminary suggestion that vinegar douches could be beneficial for treating some vaginal infections. Beaton et al. (147) found that, in women with minor vaginal irritation of unknown etiology, short-term use of a medicated povidone-iodine douche preparation resulted in improvement of symptoms, including discharge, odor, pruritus, erythema, burning, and discomfort; 94 percent of the 185 patient complaints were cleared completely. They found that 98 percent of the patients responded favorably to the douche, with no adverse effects reported. Manzardo et al. (148) found that a tetridamine vaginal lavage, twice daily for 7 days, reduced or eliminated all inflammation symptoms such as burning and leucorrhea in women with vulvovaginitis and cervicitis.

In a 1997 meeting of the Nonprescription Drug Advisory Committee of the Food and Drug Administration (149), Dr. Andrew Onderdonk presented data looking at women with abnormal vaginal ecology, such as women with culture-positive vaginal yeast infections (32). His group treated women with either sterile water, a vinegar and water douching solution, or a povidone-iodine solution. Twenty-four hours after treatment with the various douche solutions, the only women whose vaginal microflora returned to normal were the women who used the povidone-iodine douche. This suggested that, in women who have an abnormal vaginal ecology, perhaps due to a vaginal yeast infection, douching with povidone-iodine may be beneficial and may help to return the vaginal ecology back to normal values. Testing this concept in a controlled clinical trial is problematic, however, given the known risks of douching. It is unlikely that a peer review committee or a research ethics board would see merit in deliberately allocating women to a "douching encouraged" group.

Nonpregnant women who are symptomatic may derive some benefit from vaginal douching, specifically with povidone-iodine, if they have abnormal vaginal ecology. However, given the many studies that have suggested adverse effects from douching compared with the very few studies that have shown a potential benefit, douching cannot be a recommended therapy and is surely not indicated for routine vaginal "hygiene."

INTRAPARTUM OR ROUTINE HYGIENIC DOUCHING

Douching has also been used in pregnant women in labor. Stray-Pedersen et al. (150) found that intrapartum vaginal douching with 0.2 percent chlorhexidine significantly reduced mother-to-child transmission of vaginal microorganisms, such as *Streptococcus agalactiae*, and both maternal and early neonatal infectious morbidity. Dykes et al. (151) found that a single washing of the urogenital tract with 0.5 g of chlorhexidine per liter in women who were carriers of group B streptococci in weeks 38–40 of pregnancy resulted in a suppression of the number of colony-forming units of group B streptococci. However, Sweeten et al. (152) found that a one-time 0.4 percent chlorhexidine vaginal wash in laboring pregnant women did not decrease the incidence of infectious morbidity in parturients, as compared with the use of sterile water. Taha et al. (153)

noted reduced maternal and newborn sepsis rates postpartum with use of an intrapartum 0.2 percent vaginal chlorhexidine wash. Neither Gaillard et al. (154) nor Biggar et al. (155) found vaginal lavage ranging from 0.2 to 0.4 percent chlorhexidine to be protective for mother-to-child human immunodeficiency virus transmission. The above studies in pregnant women look primarily at one time douching that has little to do with typical, repetitive use of douching for hygienic reasons. However, limited vaginal lavage has utility in transient reduction of pathogenic vaginal organisms intrapartum.

Women without vaginal symptoms primarily douche for perceived hygienic or aesthetic benefit. Postcoital douching has been suggested for two purposes, reducing semen exposure to prevent pregnancy and to prevent human immunodeficiency virus transmission. After sexual intercourse, semen increases the pH of the vagina that facilitates sperm motility (144). Douching can dilute and wash out semen and can help return the vagina to its normal acidity, theoretically helping to prevent heterosexual human immunodeficiency virus transmission. Obaidullah (156) found that women who used a Betadine Vaginal Cleansing Kit before and after insertion of an intrauterine contraceptive device showed a marked absence of bacterial growth 4–6 weeks later, compared with control volunteers who used no cleansing agents. The investigators speculated that an absence of bacterial growth in the study group could help to minimize the risk of intrauterine device-related pelvic infection. These speculations and highly limited data do not, however, suggest that douching can be advocated for women. One could just as easily speculate that douching increases human immunodeficiency virus risk, increases pregnancy risk (by pressure forcing sperm into the endocervical canal, for instance), or exacerbates intrauterine device-related risks.

Despite a few dissenting views, the preponderance of the evidence suggests that douching is not necessary or beneficial and is very likely to be harmful (2–4, 6, 157–161). Multiple case reports indicate occasional very serious douching-related harm. Safran and Braverman (162) found that douching daily with polyvinylpyrrolidone-iodine for 14 days resulted in a significant increase in serum total iodine concentration and urine iodine excretion, followed by an increase in serum thyrotropin, although never above the normal range. They concluded that iodine is absorbed across the vaginal mucosa and that the subsequent increase in serum total iodine causes subtle increases in serum thyrotropin but with no overt hypothyroidism. Udoma et al. (163) reported a rectovaginal fistula following coitus in a woman in Nigeria after douching with aluminum potassium sulfate dodecahydrate (potassium alum) prior to intercourse. Vaginal douching with a bulb syringe or effervescent fluid has been reported as a cause of asymptomatic, spontaneous pneumoperitoneum (157, 164).

MEDICAL AND PUBLIC HEALTH ORGANIZATIONS AND DOUCHING

There is no official medical or public health advisory policy on whether douching should be discouraged. In January 2001, various medical organizations were contacted via e-mail and

their Web sites were searched for information pertaining to vaginal douching. The following organizations replied that they have no official policy statements or positions on the use of vaginal douche products: the American College of Nurse-Midwives, the American College of Obstetricians and Gynecologists, the American Medical Association, the American Medical Women's Association, the American Public Health Association, the Centers for Disease Control and Prevention, the Food and Drug Administration, the National Institute of Allergy and Infectious Diseases, the National Institute of Child Health and Human Development, the National Institute of Environmental Health Sciences, the National Institutes of Health, and the World Health Organization.

An American College of Obstetricians and Gynecologists' technical bulletin (165) states that vaginitis occurs when the vaginal ecosystem is altered, which can result from several factors including repeated douching. The rationale presented in the bulletin is that repeated douching may alter the pH level or suppress growth of normal, endogenous bacteria, leading to vaginitis. A vaginitis information sheet by the American Medical Association (166) states that, in women of childbearing age, vaginitis can be caused by frequent douching. They state that women of all ages can get vaginitis from chemical irritation or an allergic reaction from vaginal douches. The Centers for Disease Control and Prevention (167) state that, in a study of African-American women, an association has been found between the length of time women douched and their risk of developing ectopic pregnancy. The Centers for Disease Control and Prevention (168) have a bacterial vaginosis fact sheet stating that women are at an increased risk for bacterial vaginosis if they douche, because douching upsets the normal balance of vaginal bacteria, and that not douching can lower a woman's risk of developing bacterial vaginosis. In a *Morbidity and Mortality Weekly Report* article (169) on pelvic inflammatory disease, douching was suggested as a risk factor for pelvic inflammatory disease, but the Centers for Disease Control and Prevention stated that the data (as of 1991) did not provide enough information to determine if the positive associations were due to the characteristics of the women who douche or to the douching itself. The Centers for Disease Control and Prevention authors found that no definitive conclusion could be reached regarding the relation between douching and pelvic inflammatory disease. A Centers for Disease Control and Prevention manual on family planning in Africa cautions against douching as follows: "Douching is unnecessary to maintain vaginal hygiene. Moreover, douching is associated with an increased risk for pelvic inflammatory disease and ectopic pregnancy. Pregnant women especially should be warned about the risks associated with douching" (170, p. 195).

The National Institute of Allergy and Infectious Diseases (171) provides a health information sheet on vaginitis that states that douching may cause vaginal irritation and vaginitis. The National Institute of Environmental Health Sciences and the National Institutes of Health both reference press releases on a study by Dr. Donna Day Baird and colleagues that found a dose-response reduction in fertility with increased douching (172). The National Institute of Allergy and Infectious Diseases (173) has a fact sheet on

pelvic inflammatory disease that states that women who douche one or two times a month may be more likely to have pelvic inflammatory disease than those who douche less than once a month. Their fact sheet on sexually transmitted diseases states that, to prevent sexually transmitted diseases, sexually active women should avoid douching because douching removes some of the normal protective bacteria in the vagina and increases the risk of getting some sexually transmitted diseases (174). The fact sheet on vaginal yeast infections (vulvovaginal candidiasis) states that douching may increase the incidence of yeast infections (175). The National Women's Health Information Center (176) has an information sheet specifically on douching, stating that douching makes women more susceptible to bacterial infections and spreads existing infections into the upper reproductive tract. The National Women's Health Information Center claims that women who douche have increased bacterial vaginosis, sexually transmitted diseases, and pelvic inflammatory disease; that douching does not prevent pregnancy but may decrease fertility; and that douching increases the risk of low birth weight babies and ectopic pregnancy. They also state that the safest way to clean the vagina is to let the vagina clean itself, which it does by secreting mucus. Their final recommendation was that, if a woman has vaginal discharge, she should seek medical attention without first douching because washing away the discharge makes it harder to identify the infection. The Surgeon General's office responded to our douching-related queries by referring us to the American College of Obstetricians and Gynecologists and the Association of Professors of Gynecology and Obstetrics. Although informative fact sheets discourage douching, none of the governmental or private organizations that we contacted has an official position statement that either advocates or discourages douching.

On April 15, 1997, the Nonprescription Drug Advisory Committee of the Food and Drug Administration held a meeting to discuss vaginal douching (149). Presentations came from the Food and Drug Administration, the Nonprescription Drug Manufacturers Association, and the Purdue Frederick Company (manufacturer of Betadine medicated douche), among others. The Committee concluded that there was not enough information to determine that a causal relation existed between douching and its adverse outcomes. More research was recommended, and the Food and Drug Administration was urged to look into federal regulation and better product labels. The Committee found that some of the studies had residual confounding due to sexual behavior and underreporting of sexually transmitted diseases. A key point in this argument was that, without determining a temporal relation, the studies so far have not been able to tell which came first, douching or the adverse outcome (sexually transmitted diseases, pelvic inflammatory disease, infection), when douching may be undertaken as a way to treat the symptoms of the disease. A representative from the National Women's Health Network stated that douching had no benefit on women's health and enhanced the chances of developing upper reproductive tract infections, pelvic inflammatory disease, ectopic pregnancy, and infertility. A representative from the Food and Drug Administration's Division of Over-the-Counter Drug Evaluation stated that

the Agency considers vaginal douches to be both drugs (because they are sometimes used to treat disease) and cosmetics (because they cleanse and/or scent part of the body). From the Food and Drug Administration's review of epidemiologic studies on vaginal douching (considered published case-control and cross-sectional studies), a consistent moderate adverse or null effect of douching was noted; the evidence was considered *suggestive* that douching independently raises the risk of pelvic inflammatory disease, ectopic pregnancy, infertility, and cervical carcinoma.

FUTURE DIRECTIONS AND CONCLUSIONS

The present review suggests that future studies must assess more directly the extent to which douching is a causal factor in diseases such as pelvic inflammatory disease and bacterial vaginosis, or if douching is merely a behavior that is more common among women who are at risk of sexually transmitted diseases and/or that douching is done in response to symptoms (15). The effects of different solutions and devices must be considered in more detail. Perhaps there are adverse effects associated with douching if only certain solutions are used but less or no harm with other solutions.

The weight of the evidence today suggests that stronger regulations for vaginal douche products may be indicated, including ingredient control, clearer labeling, and a required statement on product advertisements and on the products themselves that douche products have no proven medical value and may be harmful. A prospective cohort study or, if serious ethical concerns can be resolved, a randomized clinical trial may address these questions. A randomized "community" trial could be considered, where the communities studied are a large group of people from the same area, such as a college or a city. They could be assigned at random to treatment and no treatment, where the treatment group would receive an educational program regarding the potential dangers associated with douching and the women would be encouraged to not douche. Douching prevalence and sexually transmitted disease rates could be assessed before the educational program and at regular intervals during the program. The no treatment group, receiving no such educational intervention, would be assessed in a similar way. The study endpoint could compare rates of douching and sexually transmitted diseases. However, because motivational factors for douching are individualized and often women strongly feel the need to douche, the educational program may not influence enough women to stop douching, affecting the statistical power of such a study. Feasibility and cost may be prohibitive, in which case we may continue in our present state of knowledge/ignorance.

It is accepted that pregnant women should avoid douching. Intrapartum vaginal antiseptic lavage can be highly beneficial, but this is a completely different irrigation event than repetitive vaginal douching. There are limited data that suggest that douching in symptomatic women may have some utility. The preponderance of evidence shows an association between douching and numerous adverse outcomes. Most women douche for hygienic reasons; it can be stated with present knowledge that routine douching is not necessary to maintain vaginal hygiene; again, the preponderance

of evidence suggests that douching may be harmful. The authors of the present review believe that there is no reason to recommend that any woman douche and, furthermore, that women should be discouraged from douching.

Many women douche, especially African Americans. Because the population-level health risks attributable to this common practice could be very large if douching predisposes to even a fraction of the disease burden discussed in this review, the potential salutary impact of reducing douching activity is substantial. Intervention studies may be the very best way to gain both health benefit and insight into the temporal associations of douching and adverse outcomes. We also believe that responsible government, health, and professional organizations should reexamine available data and determine if there is enough information to issue clear policy statements on douching. We believe that, when they conduct such reviews, they will conclude, with us, that since there are no demonstrated benefits to douching and considerable evidence of harm, women should be encouraged to not douche.

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