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Original Studies

Douching Behaviors Reported by Adolescent and Young Adult Women at High Risk for Sexually Transmitted Infections

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Abstract. *Study Objective:* To describe frequency of douching and reasons as timing to menses, vaginal symptoms, and coitus and the association of these behaviors to the diagnosis of three sexually acquired infections.

Design, Setting, Participants: The study involved 160 females between the ages of 14 and 25 yrs attending a STD clinic and/or community adolescent health clinics. Subjects were eligible to enter the study if they had a positive test(s) for and/or were a contact of chlamydia, gonorrhea, trichomonas, and/or nongonococcal urethritis (NGU). Reevaluation for these infections occurred at the 1-month, 4-month, and 7-month visit with one-dose antibiotic treatment provided for positive tests. Data on douching was collected at the 7-month visit only.

Main Outcome Measure: Results of tests for STI's using urine-based DNA-amplification techniques for chlamydia and gonorrhea and using self-obtained vaginal swabs for trichomonas culture.

Results: Nearly two-thirds (106/160) of the subjects ages 14–25 yrs completing the 7-month visit reported douching, with 67.7% (69/102) reporting douching once a month or more. Douching was more common in older, black participants, using injectable progestins for contraception. Douching was more common in those reporting more recent sexual partners. Douching related to menses was not associated with any of the three infections, while douching related to symptoms and coitus was associated with positive tests for infections.

Conclusions: Results suggest that for this subset of teens at high risk for sexually acquired infections, douching is a commonly reported behavior. This study suggests that the linkage of douching and sexually acquired infections is associated with contraceptive choices, self-treatment of vaginal symptoms, and sexual risk behaviors but not menstrual hygiene.

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Introduction

Many clinicians recognize vaginal douching as a behavior to be discouraged among women of all ages, especially adolescent and young adult women.[1–3] The epidemiological association of douching with negative reproductive health outcomes including chlamydial cervicitis, pelvic inflammatory disease (PID), tubal pregnancy, and infertility give impetus to these clinical interventions.[4–12] Among older women, douching in the prior year is associated with an increased risk of cervical chlamydial infection, even after adjustment for confounding factors.[4] In this same study, douching frequency increased the likelihood of chlamydial cervicitis. Among adolescents, recent vaginal douching was associated with a cervical gonorrheal infection.[13] Another study of adolescent women showed that douching during the prior month was associated with a significantly higher prevalence of chlamydial infection documented by cervical DNA-amplification tests. This association was not observed when douching was reported as occurring more than a month to three months prior to the test for chlamydia.[5]

Despite association with adverse outcomes and clinical consensus that periodic vaginal cleansing is medically unnecessary, douching is highly prevalent among adolescent and young adult women.[14] Data on douching from the 1988 National Survey of Family Growth (1988 NSFG) showed that 31.0% of the 15- to 19-yr-old age group and 41.1% of the 20- to 24-yr-old age group reported ever douching.[15] Data collected in the 1995 National Survey of Family Growth (1995 NSFG) reflected a decrease in reporting to 15.5% for the 15- to 19-yr-olds and 28% of the 20- to 24-yr-olds.[14] However, the prevalence of vaginal douching varies

considerably among sub-groups, with consistently higher frequencies reported by black women compared to white women, regardless of age group.[14,15] Although the proportion of teens reporting douching decreased between the 1988 and 1995 NSFG surveys, the major change occurred for white teens, with a decrease of 56.7% (25.4%, 11.0%) compared to 30.8% (53.5%, 37.0%) for black teens.[14,15] For those in the age group 20 to 24 yrs, the proportion of white young women reporting douching decreased by 44.0% (35.7%, 20.0%) compared to 4.9%(63.1%, 60.0%) for black young women.[14,15]

Persistence of douching despite warnings of adverse sequelae suggests that douching itself serves a powerful function for adolescent and young women. The most common reasons reported for douching are hygiene-related, usually associated with menses or sexual intercourse.[3,5,16,17] Douching as a means of contraception is reported but seems more anecdotal than widely prevalent.[6] Douching may also be a means of self-treatment for genital symptoms such as discharge or itching or odor.[3,16,17]

The purpose of this study was to intensively examine self-reported douching behaviors in adolescent and young adult women at high risk for sexually transmitted infections and the association of positive tests for three common infections obtained within the same time frame. Prior studies evaluating the association of positive tests for sexually transmitted infections (STI's) and recent douching have had varying results, with different methodologies used to screen for different infections.[4,5,13] None of those studies specifically evaluated reasons and frequency of douching and association with STI's. First, douching behaviors were documented as to solutions, frequency, and reasons for douching, which included vaginal symptoms as well as the timing of douching relative to menses and sexual intercourse. In addition, douching behaviors were assessed in terms of contraceptive and sexual risk behaviors. Lastly, reasons and frequency of douching were analyzed in order to determine their association with the diagnosis of three common sexually transmitted infections, specifically gonorrhea, chlamydia, or trichomonas.

Methods

This study is part of a larger project evaluating factors associated with repeated bacterial and protozoan STI. Subjects were aged 14 to 25 yrs attending a metropolitan STD clinic or one of three community adolescent health clinics. Subjects were eligible for entry if they were treated for *Neiserria gonorrhoeae*, *Chlamydia trachomatis*, or *Trichomonas vaginalis*, or were sexual contacts of these infections or nongonococcal urethritis (NGU). Appropriate single-dose treatment was provided for each subject, along with provision of condoms and counseling to advise sex partners of the need for testing and treatment. Each subject was instructed to return for a 1-month, 3-month, 5-month, and 7-month visit, when urine was collected for polymerase chain reaction (PCR) tests for *N. gonorrhoeae* and *C. trachomatis*. Self-obtained vaginal swabs were obtained for *T. vaginalis* culture, using modified Diamond's medium. For each visit, participants were treated for any STI. Each subject provided written informed consent but the requirement for parental consent was waived. The institutional review board of Indiana University/Purdue University at Indianapolis approved the study.

Data were collected using a self-administered questionnaire. The questionnaire required 20 to 25 minutes for completion. Items regarding douching frequency, preferred douching solutions, and reasons for douching were collected at the 7-month visit only. A single item, "*How often do you usually douche,*" assessed douching frequency. Response options were "Never," "About once a year," "4 or 5 times a year," "About once each month," "Two or three times each month," "Once a week," "2 or more times each week," and "Nearly every day." A single item assessed douching solution: "What do you usually use to douche with?" Response options were "I never douche," "Something I buy like Massingale's or Summer's Eve," "Vinegar and water," "Plain water," "Yogurt," and "Coca-Cola."

Eight items assessed the frequency of douching related to genital symptoms, menses, and sexual activity during the previous two months. Responses were scored zero ("Never") to 3 ("3 times or more"). For each participant, summing across individual items calculated a douching frequency index for each group of douching behaviors. Three items assessed *Douching Behaviors—Symptoms*: douching in response to vaginal discharge, smell, or vaginal itching (index range 0–9; mean = 0.9). Three items assessed *Douching Behaviors—Menses*: douching before menses, during menses, or after menses (index range 0–9; mean = 1.6). Two items assessed *Douching Behaviors—Coitus*: douching before sex and douching after sex (index range 0–6; mean = 1.3).

Other variables included *Age* (in years), *Race/Ethnicity* (white/black), *Oral Contraceptive Use* (past two months; no/yes), *Condom Use for Contraception* (past two months; no/yes), *Injected Depot Medroxyprogesterone* (past two months; no/yes), current infection with *Gonorrhea* (no/yes), *Chlamydia* (no/yes), or *Trichomonas* (no/yes), and *Number of Sex Partners* in the past two months.

Statistical comparisons were made using contingency table analysis for categorical variables and *t*-test to compare means. Statistical significance was defined as $P < 0.05$ unless otherwise indicated.

Results

Of the 160 women completing a 7-month visit, 106 (66.3%) reported douching frequency of greater than "never." Douching was more common among older subjects, those who were black, users of injectable progestins as contraceptives, and those with more sexual partners in the last two months, compared to subjects who reported no douching (Table 1).

Over two-thirds of those who douched reported douching at least monthly and nearly 90% chose a commercial product, with none of the participants indicating Coke or yogurt (Table 2). Reasons for douching included genital symptoms, menses, and coitus (Table 3). The most frequently cited reasons were "after menses" (73%) and "after coitus" (46%). "Before coitus" douching was reported by 28%. However, isolated precoital douching was relatively rare, with only 16% of those reporting douching before sex that did not report douching after sex (data not shown).

Douching behaviors related to symptoms, menses, and/or coitus were dichotomized to "none" or "any." Any douching related to *symptoms* in the previous two months was associated with increased risk of chlamydia and trichomonas infections. Douching associated with *menses* was not associated with increased risk of infection by any organism. Douching associated with *coitus* was associated with increased risk of gonorrhea (Table 4).

The associations between douching frequency index scores for each of the douching behaviors in the previous two months and sexually transmitted infection are shown in Table 5. Overall, the mean douching frequency index score for participants reporting douching in the last two months was 0.9 for symptoms, 1.6 for menses, and 1.3 for coitus. Douching frequency index scores for symptoms, menses, and sex were not associated with infection due to gonorrhea or trichomonas. However, higher douching index scores for symptoms and for coitus were significantly associated with chlamydial infection.

Table 1. Demographic, Contraceptive, and Sexually Transmitted Infections-by Douching Behavior

	Never (N = 54)	Any Douching (N = 106)
Mean age, yrs (SD)*	16.8 (1.9)	17.4 (1.8)
Black, N (%)*	39 (72)	91 (86)
Contraceptive use, past 2 months		
Oral contraceptives, N (%)	11 (20)	13 (12)
Condoms, N (%)**	23 (43)	62 (59)
Depot medroxyprogesterone, N(%)*	9 (17)	34 (32)
Sexually transmitted infections (STI)		
Gonorrhea, N (%)	3 (6)	12 (11)
Chlamydia, N (%)	10 (19)	24 (23)
Trichomonas, N (%)	5 (9)	6 (6)
Any STI, N (%)	15 (28)	36 (34)
Mean no. sex partners, past 2 months (SD)*	0.80 (0.66)	1.3 (1.7)

*$P < 0.05$.
**$P < 0.06$.

Table 2. Douching Frequency, by Usual Douching Fluid[1]

	Commercial N (%)	Vinegar/ Water N (%)	Plain Water N (%)	Total N (%)
Once per year	9 (10)	1 (10)	0	10 (10)
4–5 times/year	19 (21)	3 (30)	1 (33)	23 (23)
Once per month	29 (33)	3 (30)	0	32 (31)
2–3 times/month	21 (24)	3 (30)	0	24 (24)
Once per week	8 (9)	0	0	8 (8)
2 or more times/week	3 (3)	0	0	3 (3)
Nearly every day	0	0	2 (67)	2 (2)
Total	89 (87)	10 (10)	3 (3)	102

[1]Missing data on douching fluid for 4 subjects.

Discussion

We report a variety of douching behaviors and associations with sexually transmitted infections. Our results are similar to other studies where black race and older age were significantly associated with douching.[13–16] In our study douching was more common among users of injectable progestin contraceptives, perhaps related to the irregular bleeding associated with injectable contraceptives. This association has not

Table 3. Symptoms, Menses, and Coitus Relative to Douching Frequency–Past Two Months[1]

	Never N(%)	Once N(%)	Twice N(%)	Three times or more N(%)
Symptoms				
Vaginal discharge	81 (76)	20 (20)	3 (3)	2 (2)
Odor	69 (65)	25 (24)	6 (6)	6 (6)
Itching	98 (93)	0	5 (5)	2 (2)
Menses				
Before	86 (83)	14 (14)	2 (2)	2 (2)
During	97 (92)	0	7 (7)	1 (1)
After	28 (27)	39 (37)	21 (20)	17 (16)
Coitus				
Before	76 (72)	22 (21)	2 (2)	6 (6)
After	57 (54)	22 (21)	14 (13)	13 (12)

[1]Among subjects reporting any douching behavior, N = 106.

Table 4. Behavior-Specific Douching and Sexually Transmitted Infection[1]

	Gonorrhea N (%)		Chlamydia N (%)		Trichomonas N (*)	
	No	Yes	No	Yes	No	Yes
Symptoms						
None	55 (92)	5 (8)	51 (85)	9 (15)	55 (98)	1 (2)
Any	39 (85)	7 (15)	31 (67)	15 (33)*	39 (89)	5 (11)*
Menses						
None	24 (86)	4 (14)	22 (79)	6 (21)	24 (92)	2 (8)
Any	70 (90)	8 (10)	60 (77)	18 (23)	70 (95)	4 (5)
Cotius						
None	50 (96)	2 (4)	43 (83)	9 (17)	44 (92)	4 (8)
Any	44 (82)	10 (18)*	39 (72)	15 (28)	50 (96)	2 (4)

[1]Among subjects reporting any douching behavior, N = 106.
*$P < 0.05$.

been previously reported. Similar to this study, the lack of association with douching and oral contraceptive use or condom use has been previously described in another population of teens.[13] Different than previous studies, the history of an STI was not associated with a history of douching, suggesting that for young women in this age group, having a prior history of one of these three sexually acquired infections did not seem to encourage or discourage douching.[13,18]

The proportion of young women using commercial products is somewhat higher than the 48% reported in a study of teens conducted during the 1980's, but is similar to a more recent study.[13,18] This may reflect more aggressive and persuasive advertising over the past decade by the companies that manufacture and distribute such products.[1] This practice exists in spite of warnings on the packaging to consumers regarding use of such products and the potential increased risk of pelvic inflammatory disease and ectopic pregnancy. One previous epidemiological study conducted in the northwest section of the United States found no difference in chlamydia rates among users of commercial products for douching.[8] Previous studies have found an association with chlamydial infection or gonorrhea infection and recent douching, but have not looked at reasons and frequency.[4,5,13] In this study, douching for symptoms and/or coitus but not menses was associated with increased risk of having any of three STI's screened, specifically chlamydia, which has a higher prevalence in this population (Tables 4 and 5). This suggests that those behaviors and symptoms around which douching occurs may place them at increased risk for STI's, rather than the practice of douching.

Table 5. Behavior-Specific Douching Index and Sexually Transmitted Infection[1]

	Gonorrhea		Chlamydia		Trichomonas		Any STI	
	No	Yes	No	Yes	No	Yes	No	Yes
Symptoms	0.89	1.2	0.72	1.6*	0.89	1.3	0.66	1.4*
Menses	1.6	1.6	1.5	2.0	1.6	1.3	1.4	1.9
Coitus	1.2	1.8	1.1	1.8**	1.7	1.2	1.0	1.7**

[1]Among subjects reporting any douching behavior, N = 106.
*$P < 0.05$.
**$P < 0.1$.

Although widely discouraged by clinicians, not all studies report unequivocal negative consequences of douching. Among women attending STD clinics in central Africa, nearly 50% of the women reported douching. Douching with commercial antiseptics an average of three times or more a week was associated with decreased likelihood of a positive HIV test.[19] Additionally, in a population of pregnant women in Africa where the practice of douching is nearly 100%, visible warts were documented significantly less often among users of commercial douching products.[20]

None of the available data in previous studies or in this one establish a causal relationship between douching and adverse outcomes. A review of douching effects on the vagina and cervix suggests possible alteration of the bacterial environmental milieu, thus predisposing the vagina/cervix to colonization by infectious agents.[21] Current commercial products available in the United States are single agents or combinations of "purified" water, physiologic saline, acidifiers, bacteriostatics, and/or antimicrobials. Over the last decade, the delivery systems in commercial products have been modified to include nozzles with sealed ends, forcing the solution through lateral openings. Experimental data do not exist which support the hypothesis that douching fluid ascends into the upper genital tract using these delivery systems.[22] Microbiologic studies suggest the safety of acetic acid washes, demonstrating similar transient reductions in bacterial counts as physiologic saline, thought to be secondary to the effects of washing.[23] Significant inhibition of normal vaginal flora both in vaginal washes and *in vitro* samples of vaginal bacteria are documented with commercial antiseptic douche products containing povine-iodine washes.[23,24] An *in vitro* study of normal vaginal flora actually demonstrated that acetic acid washes selectively inhibit vaginal bacteria associated with bacterial vaginosis with no effect on lactobacilli colonies.[26]

As reported by other authors, this study suggests that douching may be a marker for increased probability of STI's, specifically chlamydial infections, and their consequences rather than an independent predictor.[13,21] In this population, over one-third of douchers reported douching for genital symptoms, particularly odor and vaginal discharge. This finding suggests that douching may be a responsive rather that a causal behavior.

Other studies have found the practice of douching associated with the diagnosis of bacterial vaginosis.[13,25–27] This finding may be the underlying condition that is responsible for the association of douching with chlamydia, PID, and ectopic pregnancy.[19]

Reasons to douche have been generally linked to hygiene-related issues, but studies of other populations suggest more complex issues. In our sample of young women, 28% reported douching before coitus, higher than previously reported (Table 3).[3] The practice of douching is part of a wide range of intravaginal practices. Use of such noncommercial agents as leaves and powders may be used for "vaginal tightening" effects to enhance sexual pleasure, as well as contributing to personal hygiene.[3,19,28] As well, other agents have been used postcoitally to attempt to prevent infections and/or pregnancy. Douching has been described as a method used by study participants to alter risk for STD, specifically HIV infection.[29–31] Thus, for many women the practice of douching has very important cultural significance and is often supported by a woman's family and her community as well as the media.[17]

Current data consistently associate douching with adverse medical outcomes, although causal pathways have not been identified.[13] These adverse outcomes have received greater attention that potential beneficial effects associated with douching. Moreover, efforts to discourage douching often lead clinicians to direct conflict with strongly held beliefs and cultural norms.[17] This may be especially pertinent since douching is most often linked to menstruation, a topic that is an intimate part of a woman's sense of self. In an era where the development of vaginal microbicides is a topic of increased interest, the practice of douching needs to be better understood. Although the practice of douching could form an important basis of attitudes and skills that would facilitate adoption of microbicides for prevention of sexually transmitted infections, a recent study suggests that douching may interfere with the effectiveness of microbicides intended to prevent the acquisition of STI's.[32]

There are limitations to the applicability of the findings of our study, the first being that these results, from surveying young women in an urban setting at high risk of STI's, may not apply to other populations. However, a recent report of douching practices in a college population suggests that this is a behavior that should be addressed in a variety of health practices.[33] The recall bias of self-report exists in this study but may be limited somewhat by the short study time. As well, obtaining biologic markers for infection help assess the true risk of STI's, thus not relying on just self-report of the participants. More recently published studies suggest there may be more types of solutions used and reasons discussed for douching than were included in our study design.[3,17] But the consensus is that the practice of douching requires much more systematic study to better delineate its cultural, psychological, and behavioral importance as well as its adverse outcomes.

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