

## Mini-Review

# Vaginal Douching among Adolescent and Young Women: More Challenges Than Progress

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**Abstract.** The practice of vaginal douching dates back centuries. Numerous studies have shown that douching is quite prevalent and often begins during adolescence. Motivation for the initiation and maintenance of this practice appears complex, and presents challenges to the intervention efforts.

The practice of douching remains controversial. Douching has been implicated in numerous adverse reproductive health outcomes such as increased risk for pelvic inflammatory disease, ectopic pregnancy, reduced fertility, and bacterial vaginosis. However, recent studies in developing countries have suggested that in certain circumstances, douching may actually be beneficial.

We summarize key findings from the review of published literature and ongoing research, as well as highlight research challenges to our understanding of the role of vaginal douching in reproductive health.

### Introduction

Vaginal douching, the insertion of a device into the vagina for the purpose of flushing liquid inside the vagina, has been a subject of debate in the scientific journals for decades.<sup>1–6</sup> Vaginal douching has been implicated in a number of adverse reproductive health outcomes, including increased risk of pelvic inflammatory disease (PID),<sup>5,7–13</sup> ectopic pregnancy,<sup>7,14,15</sup> cervical carcinoma,<sup>16</sup> reduced fertility,<sup>17,18</sup> increased susceptibility to sexually transmitted infections (STI), including HIV infection,<sup>8,9,19–23</sup> and bacterial vaginosis

(BV).<sup>24–28</sup> Zhang et al<sup>13</sup> conducted a meta-analysis of articles published in English literature from 1965 to 1995, and found that douching increases the overall risk of PID by 73% and the risk of ectopic pregnancy by 76%. Despite these incriminating observations, douching is performed regularly by many U.S. women,<sup>29–35</sup> and many who douche begin the practice at a young age.<sup>1,29,31</sup> Since a review of literature on adolescent douching by Merchant et al was published in 1999,<sup>6</sup> nearly three dozen original papers and two review articles on vaginal douching were added to the literature. Many recent articles document that vaginal douching continues to be a common practice among U.S. adolescent and young women.<sup>31–37</sup> In light of the continued popularity of douching among young women and adolescents, it is imperative to ascertain the psychosocial determinants of this behavior, and to define the causal relationships between douching and adverse reproductive health outcomes, and the mechanism of such associations. In addition, intravaginal practices, such as vaginal douching, have relevance in topical microbicide acceptability, and clinical trials of candidate topical microbicide.<sup>34,38–40</sup> Topical microbicide is an STI transmission prevention technology that is being explored internationally with increasing interest.<sup>41–43</sup>

New laboratory technologies may facilitate research on the influence of douching behavior on vaginal milieu, such as microflora<sup>44</sup> and proinflammatory cytokines.<sup>45</sup> Recent publications suggesting potential benefits of douching,<sup>19,22,46–48</sup> may intensify the douching debate.

The purpose of this article is to summarize key findings from the review of recently published literature, and to share relevant preliminary findings from the ongoing randomized controlled trial of a douching behavioral intervention, B-WELL study, and findings

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Synopsis: Vaginal douching, still practiced by many women, begins during adolescence. Adverse effects, controversies, and recent research on this behavior are reviewed, and challenges are summarized.

of recent cross sectional surveys of university students. Clinical implications and research challenges based on these findings are highlighted.

### Prevalence of Vaginal Douching

According to the 1995 National Survey of Family Growth, 27% of women 15–44 years of age douched regularly; 55% and 21% of black and white women, respectively.<sup>29</sup> Among 15–19-year-olds, 37% of African American and 11% of white girls reported regular douching.

Douching behavior is more common among young women, those who are less educated, living in poverty, and at greater risk of STI.<sup>6,49</sup> A study among adolescents in a small southern city found that douching was common (69% of the 169 participants reported douching).<sup>32</sup> A study of HIV-infected adolescents and behaviorally comparable HIV uninfected adolescents, ages 12 to 19 years, from 13 U.S. cities showed that 52.3% of 342 young women had douched at least once.<sup>36</sup> In a survey of adolescent women being admitted to a juvenile institution, 79% of 104 participants reported douching,<sup>33</sup> and nearly two thirds of 14–25 years old women who were positive for STI or known contact of STI cases reported douching.<sup>37</sup> Evidence suggests that douching among young teenagers has increased in recent years, and contemporary teens begin to douche at an earlier age compared to older generations of women.<sup>50</sup> Prevalence of douching was 40% in young women (mean age 18.4 years) entering the 2003 freshmen class of a historically black university,<sup>51</sup> and 54% of a convenience sample of women (mean age 19.7 years) attending the same university in 2002 reported a history of douching; over 60% of those who douche reported douching once a month or more often.<sup>40</sup>

### Motivational Factors for the Maintenance of Vaginal Douching

Women's motives for douching may include personal hygiene, disease prevention or treatment, and enhancement of sexual experience.<sup>54</sup> Studies have shown that low educational attainment,<sup>1,29,30</sup> low income,<sup>53</sup> African American race,<sup>29</sup> and living in the Southern U.S.<sup>1,29</sup> are common characteristics among women who douche. From a behavioral perspective, women who douche are more likely to have initiated sexual activity at an early age, have a higher number of lifetime partners, tend to have sex more frequently, have a history of STIs, are more likely to smoke, and less likely to use condoms.<sup>9,14,15,35,37,40</sup> Such a wide array of risk factors linked to douching illuminates the complexity of the behavior and the profile of women who choose to douche.

Several studies have examined the timing of douching, the reasons for and the substances used for douching. A great majority of women use commercial products, most commonly vinegar and water.<sup>33</sup> Commonly reported timing of douching includes after menstruation, before and after sex, and when having vaginal symptoms. By far the most commonly cited reason for douching is to feel fresh and clean.<sup>5,29,33,35,53,54</sup> Less common motivators are to prevent STIs, to cleanse before going to see a doctor, to eliminate vaginal symptoms, to avoid going to a doctor, to prevent pregnancy, a partner's request, and to tighten the vagina. These facts suggest that misinformation about the benefits of douching may also play a role in this behavior.<sup>35,37</sup> Crosby et al<sup>55</sup> found that 12% of women in their study identified douching as an HIV prevention strategy. Beliefs that douching prevents STI are not uncommon among adolescents, and young and older women.<sup>33,35,51,54</sup>

It appears that a woman's douching behavior may be influenced by her partner. In our survey of over 700 women, 14 to 63 years of age, 7% reported that a male partner's wish was the reason for the use of douching products.<sup>35</sup> In a health behavior survey of men (mean age 18.7 years old) entering the 2003 freshmen class of a historically black university, we asked "Have you ever asked your sex partner to douche?" Twenty percent of the participants reported that they had never heard of douching, 18% had asked, and 62% never asked the partner to douche (unpublished data). Among 108 adolescent women who douche regularly, 43% answered "yes" that boyfriends had initiated conversations about douching, ranging from simple curiosity ("Why do you do it?"—67%, "What does it feel like?"—22%) to requesting that she do it (9%). Fifty-seven percent had heard that douching could tighten and dry the vagina for sexual purposes, with the majority citing friends as their informants.<sup>56</sup>

In a recent study conducted with 170 adolescents and young adult women (ages 14–25 years) at risk for STI, nearly two thirds of the sample reported douching.<sup>37</sup> In this study, douching related to menses was not associated with current infection (chlamydia, gonorrhea or trichomonas), but douching related to symptoms and coitus was associated with all three infections.<sup>37</sup> Preliminary findings of our ongoing study showed that positive correlates of BV among young women (14–23 years old) who douche included having multiple partners, recent sexual intercourse, douching after menses, recent douching, and gonorrhea.<sup>57</sup> Of these factors, douching after menses showed the strongest association (OR = 5.11) with BV. This association of douching after menses with BV may be a result of douching at a time of vaginal flora instability. However, difficulty remains evaluating douching and

sexual behavior independently.<sup>57</sup> These findings suggest that further studies are needed to clarify the typology of douching behaviors and the biological effects of this varying typology.

### Why Initiate Douching?

While many women who douche begin the practice at a young age,<sup>1,29,31</sup> the determinants of douching behavior are unclear.<sup>58,59</sup> Once thought to be a learned behavior from mother, grandmother or other female relatives, initiation of douching behavior may be associated with other factors. Over 95% of females recalled that they had seen a television commercial about douching products, suggesting that vaginal douching is a normative behavior necessary to feel fresh and clean (unpublished focus group data), whereas 80% of women said that they knew someone close to them who used douching regularly.<sup>33,35</sup> Recent studies<sup>35,37</sup> confirm the conventional belief that douching is associated with high risk sexual behaviors. Many women,<sup>35,37,54,55</sup> including 25% of young women (mean age 19 years old) entering the 2003 freshmen class believe that douching prevents STIs. In our recent study, over 25% of older women tended to believe that douching after sex may prevent pregnancy,<sup>35,50</sup> whereas only 2% of college freshmen participants believed that douching prevents pregnancy.<sup>51</sup>

We have conducted in-depth interviews of 108 adolescent women (aged 14–23 years) about their douching behavior.<sup>56</sup> All participants were current douchers (douched in the previous 35 days). When asked what made them start douching initially, almost half (43%) said a close female relative suggested it (mother, aunt, sister, or grandmother), and an additional 17% named another relative, 15% said it was period-related (either their periods started, or more commonly their periods were getting heavier and/or that they were having bothersome odor), 10% said cleanliness in general, 7% said it was because they had started having sex, an additional 7% did not know, and a few others named advertisements and experimentation. Ness et al<sup>54</sup> recently conducted a multi-site study of 532 women to determine women's motivation for douching. Forty-five percent of the sample indicated that their mother recommended that they douche, followed by friends (15.2%), and advertisements (11.7%). In another study of 394 matriculating college women (mean age 18.4 ± 1.0; 95% African American), 40% reported douching at some point; of those who had ever douched, 81% did so in the preceding 2 months; 58% less than a month ago. In this study the stated reasons for the initial douching were menstruation related in 38%, to feel fresh in 25%, experimentation (curious) in 22%, sexual intercourse in 6%, told by mother to do in 4%, and 5% other reasons.<sup>51</sup> In summary, reasons

for the initiation of douching are diverse, and not limited to the influence of one's mother or mother figure.

### Prospective Studies Are Needed

Most studies linking douching to reproductive adverse effects (see Introduction) were case control studies; thus causal relationship between douching and its adverse effects remain unresolved. The mechanism of such associations remains to be determined, as well. The need for prospective longitudinal studies of the effects of douching was recognized decades ago, but very little advancement has been published in recent decades.<sup>2,6,49</sup> Ness et al,<sup>12</sup> in a multicenter study, demonstrated that frequent and recent douching was associated with endometritis. In another multicenter study, Rothman et al<sup>60</sup> found douching, compared with cloth towelette use did not increase the risk of PID.

Numerous studies have shown that BV is associated with vaginal douching.<sup>24–27</sup> Bacterial vaginosis is the most prevalent form of vaginitis, yet the etiology is unknown.<sup>61,62</sup> BV has been associated with adverse pregnancy outcome,<sup>63–65</sup> endometritis,<sup>9,66–69</sup> and complications after invasive gynecologic procedures. An association between BV and risk for HIV-1 infection in young women was found in cross-sectional studies in Uganda and Thailand women.<sup>70,71</sup> In-vitro research has suggested BV may increase the survival of HIV-1 in the genital tract.<sup>72</sup>

In the healthy vagina, hydrogen peroxide and lactobacilli prevent the intrusion of endogenous bacteria and exogenous pathogens. Lactobacilli aid in protecting the vaginal environment by producing bacteriocins and lactic acid which, in turn, facilitate the lowering of the vaginal pH level, thus creating an environment hostile to many other bacteria.<sup>73</sup>

Microbiological changes consistent with BV include a decrease in the lactobacillus population, particularly those that produce hydrogen peroxide, and an increase in anaerobic and facultative anaerobic bacteria.<sup>74–76</sup> Douching has been reported to possibly enhance the risk of vaginal infection by disrupting the normal vaginal flora.<sup>2,73</sup> Thus, adverse reproductive health effects of douching may be mediated by changes in vaginal milieu. In a cross sectional study of current douche users by Schwebke et al,<sup>57</sup> douching after menstruation was the strongest predictor of BV. This study reconfirmed the inherent difficulties in studying the independent effects of sexual activity and douching on the vaginal flora. Prospective studies are needed to determine if douching itself directly influences the composition of the vaginal flora.<sup>57</sup>

### Vaginicervical Cytokines and Douching

Although the mechanisms linking BV and adverse obstetric and gynecologic sequelae are unclear, studies<sup>45,77</sup> have shown that abnormal flora are associated with

increased cervical cytokines, and the cytokine levels return to normal after successful treatment of BV.<sup>45</sup> Yudin et al<sup>45</sup> postulated that decrease in cervical interleukin (IL)-1ss, -6, and -8 levels among women who established a normal flora after treatment for BV, but not among those with persistent BV, suggests a direct linkage between vaginal flora abnormalities and elevated cervical cytokines. The influence of cytokine concentration, in particular IL-1b, IL-6, and IL-8, has been noted as an important indicator of vaginal infection. IL-1ss and -8 are proinflammatory cytokines, and IL-6 is a cytokine with both pro- and anti-inflammatory properties.

Effects of vaginal douching on cervical cytokines are unknown. However, one can assume that vaginal douching would have influences on the cytokine levels, as well as vaginal flora changes. Such effects may vary depending on the characteristics of douching behavior, such as frequency and timing of douching, and type of solution used. Furthermore, adverse effects of douching may be mediated by its effects on cytokine levels. These hypothetical assumptions can be explored in a prospective study of douching intervention, by monitoring vaginocervical cytokine level changes and microfloral changes across a time span, along with douching behavior changes.

### **Are There Any Benefits of Douching?**

In contrast to numerous work demonstrating adverse effects of douching, several recent studies conducted in developing countries have found that douching, depending on timing of douching and type of products used, is associated with HPV regression,<sup>47,78</sup> reduced risk of STI/HIV,<sup>22</sup> and favorable changes in vaginal ecology.<sup>46,48</sup> The participants in these studies were at very high risk of STIs. In a review of medical and social science literature of the past 50 years, Brown and Brown<sup>52</sup> reported that the use of intravaginal substances has been described at least in 11 countries including the United States. Thus, it is important to confirm if douching is beneficial or at least harmless to the health of women, in any circumstances.

### **Readiness to Change Douching Behavior**

The B-WELL study is an on-going randomized controlled trial of douching intervention among adolescents who douche (5 U19 AI38514) in which the effectiveness of the client-centered intervention, based on the transtheoretical model of behavioral change, is being evaluated in terms of its efficacy to decrease douching rates among this population. Study participants were assessed regarding their intention to change (to stop douching) at baseline and followup time points. Of those who completed a 12-month followup (144 participants, aged 14–23 years, as of October 2003), data indicate that at baseline, the majority (88%,

*n* = 126) of the sample was in the precontemplation stage, indicating that they reported having no intention to stop douching any time in the foreseeable future, 5% were in contemplation, indicating that they were seriously thinking about stopping the behavior, and 11% were in the preparation stage, indicating that they were planning to stop douching soon (in the next 30 days). At the 12-month visit, of the 126 whose stage at baseline was precontemplation, 40 (32%) moved to the maintenance stage (no douching for 3 months), approximately half (48%, *n* = 69) did not progress through the stages of change but remained in the precontemplation stage, and 14% progressed some, but not to the maintenance stage. The randomization code has not been broken at this time; thus the group assignment is unknown. However, these findings indicate that in a period of 12 months, over one half of the participants progressed through the stages of change toward ceasing the behavior.

Regarding advice, attempts, and motivations to stop douching, in the multi-center study conducted by Ness et al,<sup>54</sup> more than half (54.9%) of the participants (aged 13–36 years) reported that they had been advised to stop (most often by a health professional), over 40% of the women had temporarily stopped douching at some time in the past, and 85% reported that they would stop douching if they were told that it might cause an STI, infertility, or cancer.<sup>54</sup>

Overall, the results of this study show that douching behavior is practiced by many women, is often passed down through generations from female family members, and is an obvious habit influenced by individual perceptions and beliefs. Furthermore, many women are unaware of the impact douching may have on their reproductive health. Based on these findings it is clear that interventions that inform women about the dangers associated with douching could potentially aid in deterring young women from this behavior.

### **Conclusions**

The initiation and maintenance of douching behavior in young women is a complicated behavior influenced by many factors, including family, sexual partners, body image, and advertising, among many others. Recent studies implicate high risk sexual behaviors as motivators for sustaining douching behavior. Many case control studies and cross sectional studies have demonstrated that vaginal douching is linked to adverse health effects. However, prospective studies are needed to determine the effects of douching on the vaginal environment and reproductive health, independent of sexual behavior. Further studies are needed to clarify whether vaginal douching in certain conditions or circumstances may be harmless, or even beneficial, as

recent publications involving participants from developing countries seem to indicate. Such prospective studies should further examine the different typology of douching behaviors and other behavioral influences inherent to the acquisition of STIs that may compromise reproductive health, and should be designed to explore the effect douching may have on the vaginal ecosystem, including its cyclic and dynamic nature.

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