ARTICLE

"Tooth brushing and vaginal douching: tools in preventive medicine"

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Summary

Vaginal hygiene has been and is still subject to either neglect or controversy. Most of the negative reports on vaginal douching are from the US, where douching is mainly performed by risk groups and where the question does arise: what came first douching or the vaginal disorder? The infection grade of semen is also significant and should therefore be seriously considered and included in the studies of women who practice vaginal douching. In her cytopathology practice Dr. Boon, Leiden, Holland, sees that women with a BV-associated flora are 13 times more at risk to have cervix carcinoma CIN I/II and 19 times more to harbor CIN III. The relationship between the vaginal flora and susceptibility to HIV and HPV is receiving increased attention. HIV infection was significantly associated with bacterial vaginosis (BV), trichomoniasis, gonorrhea, and the presence of a genital ulcer. Sexual intercourse is the main cause of ecological disturbance of the vagina because semen is alkaline; the environment of the coccoid flora. This coccoid overgrowth does not develop when post-coital hygiene with douching is applied. Investigations have shown that Moslem ladies (Moroccan and Arab) using vaginal douching as a regular intimate hygiene means have a much lower incidence of BV than Dutch ladies (< 1 % versus 24 %). The active removal of the vaginal debris and microorganisms with the flush of douching offers a tool in the manipulation of the vaginal environment. BV is well treated with the combination of douching and the insertion of an acid vaginal gel to install the vaginal pH of < 4.5 in which the coccoid microorganisms don't grow. We have been proving that proper vaginal hygiene, especially post-coital, is a tool in the prevention of vaginal disorders.

Content

Introduction

Oral hygiene is nowadays firmly established as a tool for the prevention of infections of the oral cavity. Tooth brushing for the removal of debris and plaque from dental elements is an effective means to prevent caries and parodontitis and can stop the detrimental bacterial activity.

It took however many years of information and education to install oral hygiene into the normal hygiene practices of the general public. Oral hygiene was first adopted by the higher social classes who visited a dental surgeon regularly.

The tools and the application of these have developed over the years. The relationship between the hard tooth brushes and vigorous brushing and retracting gum have lead to new developments in tooth brush design and brushing instructions. The dental surgeon has played the most important role in the information and education of oral hygiene.

Vaginal hygiene has been and is still subject to major neglect and controversy. Because of the negative reports from the US, many professionals such as midwives, general practitioners and gynecologists have adopted a negative opinion on vaginal douching as a means of vaginal hygiene. The use of harmful devices and douching fluids has also given vaginal douching a bad reputation. The controversy on the subject of vaginal hygiene by means of douching has not been resolved.

1. A review of literature

Interesting enough the practice of douching is strongly related to the lower social classes of the Western world where it was most often applied to avoid a costly visit to the doctor or with the hope to prevent fertilization and to “wash the baby out”. Douching is a normal practice of prostitutes even when condoms are used.

Douching is however also common practice in other societies be it with different objectives. Black people appear to douche with the same objectives as the lower class group of Western women, while douching by Moslem women is practiced as part of religious rules and rites.

Most of the negative reports on vaginal douching are from the US, where douching is practiced by more than 15 % of adolescent girls and young women, with significantly higher prevalences in certain groups in the population in casu underprivileged black women.

In these reports the effects of douching by these black women is erroneously linked to the observed high prevalence of bacterial vaginosis, PID (pelvic infectious disease) and preterm birth. These negative interpretations of the effects of douching are also of influence in other parts of the worlds such as Europe.

One of the variables most consistently associated with vaginal douching is race, with African-American women douching more regularly.(4) Among a predominantly black group of women with clinical PID, frequent and recent douching was associated with endometritis and upper genital tract infection.(1)

Douching may explain a substantial proportion of the black-white disparity in preterm birth. It may also facilitate the ascent of microorganisms into the upper genital tract, resulting in a chronic bacterial colonization inside the uterus. During pregnancy, the host inflammatory response is initiated, which stimulates preterm labor and birth (3).

Ethnic differences in genital hygiene behaviors can explain a twofold increase in the risk of bacterial vaginosis in black Caribbean compared with white women. The role of vulval and vaginal cleaning practices in the development of bacterial vaginosis is unlikely. Studies in other countries than the US with its underprivileged douching subpopulation ought to be undertaken.(5)

2. Comments on this literature

In these reports several important factors were not researched and included. These are the factors that are reported with respect to racial differences in vaginal flora, the infection grade of semen, the douching tool and religious background. In many reports the douching fluids are not included.

We are not the only ones to feel critical about these American studies. Rosenberg c.s (1992) has put a big question mark on the relationship between douching and the promotion of PID (pelvic infectious disease). The negative trias of STD, PID and ectopic pregnancy appears to be present in the American douching population. It is extremely difficult to collect trustworthy data that are related to sexual behavior. The interpretation of studies on douching is therefore hampered because sexual details are precisely very important. What came first; the STD or the douching? It would be interesting to compare the number of complications in gynecological health in a same group of “high risk women” when douching and when not douching.

Racial differences in vaginal flora

Racial differences in vaginal flora are of influence when reporting on the influence of douching on vaginal problems and complications. African American race have a consistent association with vaginal microflora, specifically, Mycoplasma hominis, Trichomonas vaginalis, bacterial vaginosis, group B streptococci, Neisseria gonorrhoeae, and Chlamydia trachomatis. The presence of other microorganisms and race have a more consistent association with the presence or absence of a cervical-vaginal organism than sexual behavior, hormonal status, vaginal devices, or the presence of abnormal vaginal bleeding.(2)

Semen

The infection grade of semen should be seriously considered and included in the studies of women who practice vaginal douching. Chlamydia trachomatis attached to spermatozoa recovered from the peritoneal cavity of patients with salpingitis. (11). This observation suggests that spermatozoa may serve as vectors for C. trachomatis and spread this pathogen to the peritoneal surfaces of the uterus and fallopian tubes.

It is suggested that the bacterial flora of the seminal fluid can play a role in developing salpingitis in the female and that spermatozoa may be involved in delivering bacteria to the higher genital tract structures (12).
Seminal fluid from asymptomatic men reveals a wide variety of aerobic and anaerobic bacteria. The number of bacteria tends to correlate with the sexual experience of the individual. Experimental evidence has shown that these bacteria can attach themselves to moving spermatozoa and travel through ovulatory-phase cervical mucus. (13)

In 182 patients, 552 microorganisms were detected, including Enterobacteriaceae (2.8%), Gardnerella vaginalis (9.6%), Chlamydia trachomatis (1.6%), Mycoplasma genitalium (0.9%), and Ureaplasma urealyticum (11.8%). Semen quality was neither related to occurrence of microorganisms nor pyospermia. (15)

Gardnerella vaginalis was isolated from 22 (38%) of 58 semen samples obtained from men attending an infertility clinic. (16)

Cervical swabs of 50 pregnant women with subacute amniotic infection syndrome (AIS) and the semen of their consorts were bacteriologically analyzed. In the control group were 50 healthy pregnant women and their consorts too. Pathogenic bacteria (the most common were Escherichia coli, Staphylococcus haemolyticus, Chlamydia trachomatis and Ureaplasma urealyticum) were isolated from the cervical swab of 50 pregnant patients with AIS in 86 % of them, while in the control group of healthy pregnant women in 28 %. Pathogenic bacteria were present in 70 % of semen of consorts pregnant women with AIS and only in 30 % of semen of the control group. The congruity of pathogenic bacteria in the cervical swab and semen in the investigated group was 69.2%, while only 35.7% in the control group. The authors presume the amniotic infection syndrome should be ascending manifestation of nonspecific vaginitis, which is maintained by the consort's urogenital infection. AIS should be classified as a 'sexually-transmitted disease'.(18)

There is evidence for ease of transmission of human papillomavirus DNA from sperm to cells of the uterus and embryo. (14)

It is unlikely that heavily infected sperm is completely removed by vaginal douching, thus, even douching women are at risk to become infected when having unprotected sex with such men.

Douching fluids

In Europe commercial douching fluids are exclusively acidic fluids. Antiseptic douching fluids are not available as they are in any supermarket in the US. This factor has to be included in the negative reports on vaginal douching.

HIV infection was two times more frequent in women using antiseptics. The study confirms the widespread practice of douching in African pregnant women. The harmful effects of antiseptics need to be substantiated. (6)

The use of a douche preparation containing acetic acid caused a transient reduction of the total bacterial counts, with most of the change attributable to the effect of washing the

surface of the vaginal vault as noted with physiologic saline. In contrast, the povidone-iodine preparation caused a significant reduction in total counts. (10)

Douching apparatus

It should be noticed that an ascending infection can only be caused by douching with a very high douching pressure of more than 200 mm Hg to push fluid from the vagina into the endocervical canal. The relationship between vaginal douching with high pressure and complications was reported in two cases (20. 21.) These vaginal douches are not any more on the market in the US and no such cases have been reported any more.

3. In favor of douching

Already 1989 Boon et al. noted the association between hygiene and HPV in Human Papillomavirus (HPV)-associated male and female genital carcinomas in a Hindu population on the island of Bali. In this population boys are not educated in penile hygiene, phymosis is predominant and here we see that the male is not only vector but also victim. In her cytopathology practice Dr. Boon sees that women with a BV-associated flora are 13 times more at risk to have CIN I/II and 19 times more to harbor CIN III (23).

The relationship between the vaginal flora and susceptibility to HIV and HPV is receiving increased attention. HIV infection was significantly associated with bacterial vaginosis (BV), trichomoniasis, gonorrhoea, and the presence of a genital ulcer.(19)

Sexual intercourse is the main cause of ecological disturbance of the vagina because semen is alkaline; the environment of the coccoid flora. We found that it takes the average woman 4 days to restore the original pre-coital pH (23). After coitus the pH of the vagina increases significantly from acidic to slightly alkaline (7). In this alkaline environment coccoid bacteria – which thrive at an elevated pH - may increase explosively with a growth peak at some 36 hours after the " alkaline shock" of the sperm. This coccoid overgrowth does not develop when post-coital hygiene with douching is applied. (23)

In view of these facts and the fact that semen can be a vector in the transmission of microorganisms it seems only logical to clean the vagina after coitus. Just as it is logical to brush ones teeth after a meal.

Douching with water or acidic fluids appears to be an effective tool to clean the vagina. Specifically to remove debris from the fornices in which coccoid bacteria may flourish.

Several reports relate to the benefits of post-coital douching with water. Semen appears to remain present and alive, much more than people are aware of. Generally, as the interval between coitus and preparation of the smears (postcoital interval) increased, the percentage of smears with spermatozoa and the mean number of spermatozoa per smear decreased, but the percentage of spermatozoa with tails did not change significantly. Spermatozoa were found irregularly after the seventh and rarely after the tenth postcoital day. (17)

Vaginal douching with water performed just after sexual intercourse could significantly reduce semen components and restore physiological cervicovaginal pH. Frequent persistence of

semen in CVS (cervical vaginal smear) from heterosexually active African women leads to a shift from acidity to neutrality that could favor male to female HIV transmission. Vaginal douching provides significant elimination of semen after sexual intercourse; it should be considered for study as a supplementary means for the prevention of heterosexual HIV transmission. (7)

Again the importance of the douching fluid was stressed. Water or acidic fluids are efficient and apart from the temporary removal of the flora of no detrimental influence as opposed to antiseptics and water with soap.

In a study on African female sex workers (19) regular douching was reported by 72% of the women, of whom the majority inserted fluids in the vagina, generally after each sexual intercourse. Water with soap was the fluid most often used (81%), followed by salty water (18%), water alone (9%), and a commercial antiseptic (5%). There was a significant trend for increased frequency of douching and higher prevalence of BV. There was no direct relation observed between douching and risk for HIV infection or other STDs. This study obviously neglects the impact of the douching fluid on the flora. The researchers were however surprised to find that there was no association between HIV infection and these douching habits which indicates that the infection grade of semen and the favorable effect of its removal was not considered.

4. Dutch observations on douching

The time has come to have a look at the beneficial effects of intense vaginal and post-coital hygiene. Since 1985 the LCPL (Leids Cytologisch and Pathologisch Laboratorium) provides the general practitioner next to the cytological diagnosis also with the advice to instruct the woman to douche after coitus. We have no reason to be concerned that we have caused pathology with our advices to practice post coital douching, such as sexually transmitted diseases (STDs), pelvic inflammatory disease or ectopic pregnancy, because none of these effects were reported by the GPs who pass our advises to their patients. The GPs interviewed by us concerning this point must have given the douching advice for over 10,000 women over the past 15 years.

One GP in Amsterdam has a large practice of a 1000 Japanese women. Interesting is the fact that these don't use hormonal contraceptives but the condom for birth control. They are very focussed on hygiene and have incorporated douching as a routine in vaginal hygiene. In this practice never any negative douching related side effect such as PID or ectopic pregnancy could be reported.

We identified the smears from ten Moroccan women of our GP and matched them with Dutch women of the same age in her practice ((Dutch 1 of Table I and II). In addition, we identified 100 smears from Arabic women and matched them with 100 Dutch women of the same GP-practices (Dutch 2 of Table I and II). The Moroccan and the Arabic women had more frequently a completely clean smear in which no bacteria could be visualized (Table I). This indicates that the practice of vaginal rinsing of these Moslem women did remove the bacteria in many cases in such a degree that we could no longer see them in the smears. In addition, the bacterial flora, when present in large enough numbers for us to see, was more frequently in balance ("mixed flora"). Finally, we mention that we observed the signs of BV only in one

Moslem lady (less than 1%), twenty times less frequent than in the Dutch ladies of the same GPs. (24)

Table I. Smears devoid of bacteria, data stratified according to ethnic group.

	No bacteria		Bacteria		Total
	n	%	n	%	n
Moroccan	5	50%	5	50%	10
Arab	52	51%	49	49%	101
Dutch 1	0	0%	10	100%	10
Dutch 2	7	7%	93	93%	100

Table II. Bacterial florae as visible by Jones Marres method, data stratified according to ethnic group.

	I		II		III		IV	
	Moroccan		**Arab**		**Dutch 1**		**Dutch 2**	
	n	%	n	%	n	%	n	%
Bacterial vaginosis	0	0%	1	2%	2	20%	18	19%
Cocci	0	0%	1	2%	1	10%	14	15%
Mixed flora	2	40%	18	36%	3	30%	19	20%
Lactobacilli	3	60%	28	57%	2	20%	23	25%
Lactobacillose	0	0%	1	2%	2	20%	19	20%
Total	**5**		**49**		**10**		**93**	

In another study we elaborated on this subject. (25) From the cytology archive, 779 smears from Moroccan immigrants were retrieved and 1,061 smears of matched Dutch women. For the classification of the bacterial flora a silver staining technique, the Jones-Marres method, was employed. These Moroccan women had cleaner smears and the prevalence of BV-associated flora was low being 3% versus 24%.

In order to study the influence of the pH of douching fluids on the vaginal pH women were asked to douche with plain water, salted water (one tablespoon to 1 litre) and a commercially available douching fluid with pH 4. The vaginal pH was checked before douching, directly after douching, at 4 hours and 12 hours after douching with pH indicator strips (Merck, 4.0-7.0). At these measure points the women also made a vaginal smear. Women are very capable to make their own vaginal smear when well instructed. They were provided with sampling materials; (Cervibrush, CellPath) and slides. The smears were sent to the LCPL where they were stained and evaluated.

With these results it can be concluded that douching increases the vaginal pH by the active removal of lactobacilli. Because none to very little fluid remains in the vagina the pH of the douching fluids has no influence. An acidic douching fluid does not restore the vaginal pH. The vaginal pH is restored by the re-growth of lactobacilli.

The active removal of the vaginal debris and microorganisms with the flush of douching offers a tool in the manipulation of the vaginal environment. BV is well treated with the combination of douching and the insertion of an acid vaginal gel to install the vaginal pH of ‹ 4.5 in which the coccoid microorganisms don't grow.

The frequency of vaginal douching by a woman depends on her individual anatomy with respect to the fornix posterior and her sexual activity. It took many years to establish the relationship between oral hygiene and caries and to incorporate tooth brushing as a means of prevention. We have been proving that proper vaginal hygiene, especially post-coital, is a tool in the prevention of vaginal disorders. In the context of the reported synergetic effects of BV on HPV and HIV-infection, it seems wise to advocate intensive vaginal hygiene for women in the reproductive age.

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