Pre-cum

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Dear Readers,

Spring has arrived at the HIVreport’s editorial office. This issue introduces a fresh new look for the HIVreport and connects it more closely to the DAH website. All topics will now be easier to find and will offer links to our other information services. This is meant to increase the HIVreport’s usefulness while making it more exciting to read.

The focus of the HIVreport’s current issue also happens to be on excitement, or more specifically, pre-ejaculate.

Questions about what role this small drop of liquid has in HIV transmission have puzzled many experts. We decided to get to the bottom of this, all the way to the pelvic floor, where the pea-sized glands are located that produce pre-ejaculate.

Bottom line: The established facts of HIV prevention still apply. Pre-ejaculate is of no concern in oral intercourse. Oral contact with pre-ejaculate is still considered “safer sex”. However, this is not the case with vaginal and anal intercourse, where pre-ejaculate may well lead to an HIV infection (or pregnancy).

The second topic is – once again – pre-exposure prophylaxis (PrEP): In the two previous HIVreports, we discussed the findings of the first phase-3 study. Unfortunately, we now have some unexpected bad news: A PrEP study on women from southern African countries was stopped. This is why, for the third time in a row, we are informing you about PrEP, which seems to become a prominent topic this year.

Best regards,
Armin Schafberger, Steffen Taubert
“I’ve heard that pre-cum contained an extreme concentration of HIV. Others say the exact opposite.” Questions like this are frequently asked in the Health Support section of the gay dating site Gayromeo as well as on other online advice sites.

Pre-cum or Pre-ejaculate – What’s that?
The clear fluid that is secreted by the urethra of a man’s penis after sexual arousal prior to ejaculation is referred to as pre-ejaculate, Cowper’s fluid, and colloquially as pre-cum. The amount varies from a few drops up to 5 ml [1]. In rare cases, the amount may be larger and is perceived by some men as uncomfortable or embarrassing.

Where does it come from?
Pre-ejaculate originates from glands whose existence and name is even unknown to many doctors. It is primarily produced by two pea-sized bulbourethral glands (also called Cowper’s glands) that are located below the prostate and release their secretions directly into the rear of the urethra. They are supported by the smaller Littré glands located in the penis along the urethra.

What's in it, and why?
Pre-ejaculate serves as a natural lubricant during sex and subsequent ejaculation. It flushes out residual urine and changes the chemical environment in the urethra (from acidic to basic). This secretion thereby acts as a buffer in vaginal intercourse before any sperm enters the vagina’s acidic and rather “hostile” environment. Additionally, the secretion’s constituents are considered to have immune defence properties [2].

The secretion of the Cowper’s gland itself is free of sperm. Several authors have nevertheless found sperm in pre-ejaculate, sometimes even in almost half of their study subjects [3]. There are two possible explanations for this observation: It was either residual sperm from a previous ejaculation, or sperm from an imminent ejaculation that prematurely exited the urethra. Given the technically tricky “extraction” of pre-ejaculate,
it is almost impossible to distinguish between pre-ejaculate and ejaculate. Sperm found in inherently sperm-free pre-ejaculate is the main reason why coitus interruptus, i.e. the pull-out method, is not recommended for heterosexuals as a suitable method of contraception.

**A Comparison: Ejaculate**
Semen consists of various secretions produced by the epididymis (located behind the testes), the seminal vesicles (located behind the prostate), the prostate and the Cowper’s glands. The sperm cells originating from the testes only make up a very small part of the volume, with most of the ejaculate coming from the prostate.

**A Comparison: The boar**
Humans and pigs have a fairly similar anatomy. There is, however, at least one difference between man and pig in the anatomy and function of the bulbourethral glands.

A man’s bulbourethral gland is only pea-sized and produces hardly any secretion worth mentioning. A boar releases about 40 grams of fluid from a gland up to 20 cm (8 inches) in length during, but not before, the final thrust of ejaculation. This secretion reacts with the proteins of the seminal vesicles, forming a viscous gel that closes the cervix to prevent the semen previously ejaculated into the uterus from leaking back out [12]. Bottom line: Men drip before, boars drip after – and seal it off.

**HIV in Pre-ejaculate**
There are only two small-scale studies from 1992 that investigated whether pre-ejaculate contains HIV. Due to the difficult extraction of pre-ejaculate, there is no other available research known to us.

The study by Ilaria et al. [10] used DNA measurement to detect the presence of HIV, while the study by Pudney et al. [11] employed HIV-antibody markers. Result: Immune cells containing HIV were found in most of the 23 examined pre-ejaculate samples from HIV-positive subjects.

**Neither of the two studies provided any information about the detection of free viruses in pre-ejaculate.**

The studies did not offer any statements about concentration (referred to as viral load) or comparisons between the concentration of HIV in pre-ejaculate and ejaculate.

The study findings have been interpreted to suggest that pre-ejaculatory fluid tends to contain less HIV than semen while still being potentially infectious. However, based on this research, it is not possible to determine if, and under what circumstances, pre-ejaculatory exhibits a higher or lower concentration of HIV.

It can be assumed (although not scientifically proved) that the concentration of HIV in pre-ejaculatory fluid – as well as in blood and other secretions – is higher in the case of acute HIV infection and will be low or no longer detectable after several months of successful HIV treatment.

**A Comparison: HIV in ejaculate**
HIV is found in ejaculate as both a free virus and in immune cells (lymphocytes and macrophages). HIV is an RNA virus. However, when the genetic material of HIV is integrated into the genetic material of the human cell, it must be present in the form of DNA – as in humans. This integrated HIV DNA can be measured.

1 This is why pigs are used as subjects in medical trials (e.g. testing new anaesthetic techniques) and as heart valve donors. The transplantation of other tissue from pigs to humans, such as pancreatic islet cells for the treatment of diabetes, is currently being researched.

2 HIV is an RNA virus. However, when the genetic material of HIV is integrated into the genetic material of the human cell, it must be present in the form of DNA – as in humans. This integrated HIV DNA can be measured.

3 HIV can be transferred by both free viruses and viruses in cells (cell-to-cell contact).
While the sperm themselves are free of HIV, the virus is capable of attaching to the sperm’s surface. Sperm washing in assisted reproduction therefore makes it possible to obtain HIV-free sperm.

HIV originates from all secretions of the ejaculate. However, it has yet to be determined which gland(s) are primarily responsible for the concentration of HIV in sperm, and to what extent immune cells (macrophages) in the lining of the urethra are able to release HIV [7].

A large part of the viruses in ejaculate appears to come from the prostate and the seminal vesicles [8]. This is supported by the fact that there is no noticeable decrease in the concentration of HIV in sperm after a vasectomy (severing the vas deferens from the testes and epididymis).

According to an examination by Smith et al., the concentration of HIV in ejaculate may be even higher after a prostate massage (using a finger), at least in some of their male test subjects [9].

**Neisseria Gonorrhoeae in Pre-ejaculate**

The bulbourethral glands are no strangers to gonorrhoea. Neisseria gonorrhoeae infect the urethra and its accessory glands4. In chronic (untreated) gonorrhoea, they may persist in the bulbourethral glands for a long time. These glands are also a reservoir for bacteria.

This means that in the event of a bacterial infection, the pre-ejaculate contains N. gonorrhoeae (or chlamydia) while also carrying the bacteria located in the urethra. Even when there is no contact with sperm during oral sex, N. gonorrhoeae may still infect the throat5. The preliminary results of the recent PARIS study by the Robert Koch Institute indicate that one in twenty MSM had N. gonorrhoeae of the throat.

People with living with HIV/AIDS who have a gonococcal infection of the urethra, have three times more often HIV in the urethra [13]. This will increase the risk of HIV transmission through unprotected vaginal or anal sex. The diagnosis and treatment of gonorrhoea (and chlamydia) is therefore an important factor in preventing HIV.

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4 N. gonorrhoeae may also infect the throat (after oral sex), the rectum (after anal sex) and the cervix (after vaginal sex). They may also cause so-called ascending infections of upper organs, e.g. Fallopian tubes, prostate, spermatic cord, epididymis, ...

5 Chlamydia appear to infect the throat less often that N. gonorrhoeae
verse of safer sex, all knowledge about po-
tential risks of infection, as well as all those
nagging fears and uncertainties that affect so
many people.

To put it another way: We know that nothing
can happen – but does this mean we can all
blow easy?

Here’s what happens in a real life situation:
As long as we don’t see or taste anything,
everything is fine, so a tiny drop of liquid is
not going to kill us. But as soon as the
thought of pre-ejaculate, no matter how little it
may be, enters our mind, it can unleash a
whole landslide of worries.

First of all, it’s not always just a drop; the
amount of pre-cum can vary greatly. So what
if it’s not a drop, but a trickle or even a stream
– could this be the very exception to the safer
sex rule? Wouldn’t this mean that those ex-
tremely few viruses per micro-litre all add up
to exceed the risk threshold?

Does that even qualify as pre-cum anymore?
Or could that already be semen? There are
men who produce a lot of pre-cum and there
are those who produce little semen. Consis-
tencies vary. Both fluids pass through the
same opening in short succession. Pre-
ejaculate and ejaculate – practitioners only
draw a fuzzy distinction between these two
terms. And let’s be honest, saying that “a very
low concentration of the virus is not enough
to become infected” does not make for a very
solid argument. To make things even more
complicated, it’s also been reported that pre-
cum in the rectum may very well be danger-
ous after all. Any feeling of safety we may
have had is flushed down the drain!

Consider this: Last night I bit my tongue, this
morning I sliced my gums with dental floss,
and mucous membranes can’t be trusted an-
way. Wouldn’t a situation like this leave the
door wide open for HIV infection?

The issue of pre-ejaculate fuels a flurry of ir-
rational fears that are particularly difficult to
cope with because there are also some rea-
sonable doubts involved. That’s what safer
sex is like: While striving for total commit-
tment, we are secretly calculating the proba-
bilities – and always expect the worst. The
residual risk has to be taken, but we fool our-
selves by blowing it out of proportion, be-
because fear is one of the most skilled
illusionists under the sun.
Conclusions for Prevention

Pre-ejaculate is no easy subject. When assessing the risk of HIV infection, it is not essential to know whether the concentration of HIV in pre-ejaculate is slightly lower or higher than in semen.

What’s most important is the type of sex that was practiced and the mucous membrane that came into contact with the pre-ejaculate. In the mouth, pre-ejaculate does not pose a risk of HIV transmission. In the vagina, pre-ejaculate is very likely to pose a high risk of HIV transmission.

Oral sex

HIV: Pre-ejaculate of no concern

In general, oral sex (including contact between mouth and semen) only poses a low risk of a HIV transmission [14,15,16]. To further reduce this low risk, the safe-sex message is to avoid taking ejaculate in the mouth. This message permits oral contact with pre-ejaculate, and has been proved in millions of cases over a quarter of a century.

HIV is also a “problem of quantity”. The small quantity7 of HIV in pre-ejaculate is not enough for oral (!) transmission. This is because the oral mucosa is much more resilient8 than the genital and rectal mucous membranes, in addition to the diluting effect of the saliva and the short period of exposure before the fluid is swallowed.

N. gonorrhoeae: Infection of the throat possible

A gonorrhoea infection of the throat is a previously underestimated or rather little-known condition. During oral sex (with ejaculation), these pathogens can be transmitted through contact with the urethra and pre-ejaculate.

Safer sex (“Get out before it comes”) does not provide protection against gonorrhoea during oral sex. Sexually active people who practice oral sex with various partners should consider the possibility of having contracted gonorrhoea – although that disease often progresses without any apparent symptoms. Only a routine test (throat swab to measure bacterial DNA = PCR) can provide clarity in this case. However, these examinations have so far been rarely performed in medical practices.

Sex workers are advised to wear condoms also for oral sex to prevent gonococcal infections (and other STIs, e.g. syphilis).

Vaginal and anal sex

Pre-ejaculate as HIV risk

The pull-out or withdrawal method (also called “coitus interruptus”) is often used with the intention to prevent pregnancy or HIV infection. Scientific studies have demonstrated the opposite: This method provides no protection against pregnancy or HIV. Pre-ejaculate may have a significant role in this case.

In a study on Canadian homosexual and bisexual men, Liviana Calzavara et al. [4] identified the delayed application of condoms during anal sex as a major HIV risk factor for the receptive partner. They assume that pre-ejaculate may contribute to this increased risk.

In two studies on Australian gay men, Jin et al. discovered a risk for the receptive partner during anal sex when the insertive partner withdrew before ejaculation [5]. The second study (see HIVreport 1/2010 for detailed information) found that unprotected anal sex without ejaculation was still half as risky as unprotected anal sex with ejaculation [6] – thus posing a high risk.

So far, it has not been possible to scientifically prove whether pre-ejaculate is the cause of that high HIV risk, or if there may be other reasons involved (unintentional ejaculation, small bleeding injuries on the partner’s penis, ulcers on the partner’s glans or foreskin leaking HIV-infected secretions). Small amounts of pre-ejaculate may, however, also pose a risk of HIV transmission, since the mucous

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6 Nothing is 100% safe, neither medicine and prevention nor nuclear safety or air travel. In very rare cases, oral sex may lead to infection even if there was no oral contact with semen.

7 A man simply doesn’t have the tremendous secretion volume of a boar

8 After all, the oral mucosa has to withstand many things, including spicy foods, hot tea, acidic juices and distilled spirits.
membranes of the cervix and the intestine are more susceptible than the mouth – even when there are only small amounts of HIV-infected secretions.

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News Bulletin

PrEP Study Stopped

On 18 April 2011, Family Health International (FHI) announced that it will stop the FEM-PrEP HIV-prevention study, in which some 2,000 women from Kenya, South Africa and Tanzania participated. The study investigated whether a daily dose of Truvada can prevent HIV infection and reduce the number of HIV infections. Preliminary study results indicated that the group of women who received Truvada® (Tenofovir plus Emtricitabin) for several months had the same number of infections as the control group, suggesting that this PrEP was not able to reduce the number of HIV infections. The exact reasons for this are not yet known. It is unclear if the outcome may be due to low adherence to the study regimen, or interactions between Truvada and other drugs or foods, or a general ineffectiveness of PrEP in vaginal intercourse (a study among MSM in late 2010 indicated 44% protective efficiency), or if PrEP only failed to be effective in this particular study, or if it only happened to be effective in the iPrEx study among MSM. A final evaluation has yet to be made – leaving the matter open to speculation for now.

These results are not expected to mean "the end" for PrEP. Although the FEM-PrEP was stopped, there are still other ongoing PrEP studies whose results are expected to be released in the next few years (overview in HIVreport of December 2010, further information on the MSM-PrEP study).

In February 2011, the U.S. Centers for Disease Control published guidelines for the use of PrEP among MSM in response to the iPrEx study findings: That move may have been premature (see HIVreport 1/2011).

Competence Networks Ends HIV Cohort

Funding for the HIV/AIDS Competence Network ends in April 2011. Now that state funding has run out, the Competence Network for HIV/AIDS will have to give up its plans for a long-term patient database. All attempts to raise money for the continuation of the HIV cohort failed. The competence network plans to keep the collected data and biomaterial until June 2016 to allow for the completion of ongoing research projects and to give scientists the opportunity to continue working with the compiled material for a few more years. Is there even any point in preserving data for such a long time when there is only "old data" left anyway? How secure are the data and the biomaterial when there is no longer a funded administrative structure? Should study participants continue their participation, or would they be better advised to revoke their consent? This May, the DAH will provide a critical analysis and in-depth coverage of the developments in the competence network on „blog.aidshilfe.de“ and “HIVreport.de” to shed some light on these questions.

New Website for HIVreport

Over the next few months, the HIVreport website will be moving to be integrated into the website of Deutsche AIDS-Hilfe. This will connect the contents of the HIVreport even more closely to the DAH’s other media. The search function on aidshilfe.de will then make it possible to conveniently list all contents of the HIVreport. The "old" web address will remain available for the transition period. Subscribers to the HIVreport will from now on receive their PDF file from "aidshilfe.de".
References


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