

Prevention of sexually transmitted diseases with antibiotics

Medicine and Health Policy Unit, handout for counsellors. 18.06.2024

'Doxy-PEP' or 'Doxy-PrEP' refers to the preventive use of the antibiotic 'Doxycycline'. This is intended to prevent certain sexually transmitted diseases. We summarise what counsellors in AIDS service organisations should know about this prevention strategy.

In recent years, there have been more and more reports about the preventive use of antibiotics against STIs. This prophylactic intake is often referred to as Doxy-PrEP (when taken daily as a preventative measure) or Doxy-PEP (when taken shortly after sex). The German STI Society (DSTIG) published a [statement](#) on this in mid-2023 and uses the generic term 'antibiotic STI prophylaxis'.

Through HIV-PrEP, many people have experienced what sexuality can be like when worries about HIV infection no longer play a role. However, HIV-PrEP cannot, of course, protect against the transmission of other STIs. This raises the obvious question of whether a drug-based strategy can also be used to prevent STIs. In fact, there are antibiotics that, when taken prophylactically, offer a certain degree of protection. However, a differentiated view of this prevention strategy is required in order to assess the benefits and possible risks.

Intake regimen

Two scenarios were investigated in the studies on the benefits of antibiotic STI prophylaxis. On the one hand, the daily intake of 100mg of doxycycline over a longer period of time (doxy-PrEP or doxycycline **pre**-exposure prophylaxis) was investigated, and on the other hand, the one-off intake of 200mg of doxycycline preferably within 24 hours (and up to a maximum of 72 hours) after sex (doxy-PEP or doxycycline **post**-exposure prophylaxis). The DSTIG statement only refers to the intake of doxy-PEP up to 24 hours after sex, so it may make sense for users to take this somewhat shorter time window into account (in the most recent study by Molina et al., see below, the average time between sex and taking doxy-PEP was 15 hours, 95% confidence interval: 5-30 hours).

Effectiveness

The few studies available to date show that Doxy-PEP/PrEP can actually prevent infections with syphilis or chlamydia relatively well (although not 100%). However, the situation is different for gonorrhoea, as gonococci have been resistant to doxycycline for many years, more so in Europe than in North America. In Germany, less than 10% of gonococci (gonorrhoea pathogens) are currently sensitive to doxycycline. Accordingly, **no** protective effect against gonorrhoea is to be expected. Doxycycline is also **not** effective against herpes, genital warts, mpox...

Important to know: The effectiveness of antibiotic STI prophylaxis against syphilis and chlamydia has been proven in studies with gay or bisexual men and a few trans women living with HIV or using PrEP. In this context, they were tested for these pathogens every three months. No corresponding effect was shown for cis women in the only existing study. For all other groups (cis and trans men who do not have sex with men, cis and trans MSM without HIV, or cis and trans MSM who do not take HIV PrEP), no studies have yet been conducted. Due to the significantly lower infection rates with chlamydia and syphilis in

particular, studies with very high case numbers would be required to demonstrate significant reductions in the frequency of infection.

Side effects

The benefits of antibiotic STI prophylaxis are offset by side effects and possible long-term damage. Common side effects of doxycycline are allergic reactions with rash and drop in blood pressure, photosensitivity reactions (reddening of the skin and blistering like sunburn), nausea, vomiting, flatulence and diarrhoea. Occasionally, blood clotting disorders, inflammation of the mucous membranes of the mouth, throat and stomach and blood in the urine occur. Every antibiotic also disrupts the body's natural microbiome.

Note: Some preparations can damage the mucous membrane of the oesophagus if they get stuck in the oesophagus. It is therefore important to drink plenty of fluids when taking the tablets (but not calcium-enriched drinks) and not to lie down immediately after taking them. Taking the tablets is easier on the stomach if you also eat a snack. Alcohol reduces the effectiveness of doxycycline.

Contraindications

The main contraindications for doxycycline are pregnancy and breastfeeding. Doxycycline interacts with several medications - be careful when taking acne medication, heart and asthma medication, anticoagulants, cholesterol-lowering or heartburn medication, other antibiotics, sleeping pills, epilepsy or migraine medication and diabetes medication at the same time. If in doubt, discuss with a medical professional in advance.

Risk of resistance development

Experts are concerned that increased prophylactic use of doxycycline may promote the development of resistance. This has already been shown to some extent in the efficacy studies. In people who regularly take doxycycline, other germs become more difficult to treat in the long term and the risk of fungal infections increases, especially in people with vaginal infections. Increased antibiotic use at a population level always has an impact on people who take little or no antibiotics themselves, as resistance can be passed on from bacterial pathogens. Bacterial infections, including sexually transmitted diseases, could become increasingly difficult to treat in the future.

There is also the risk of undetected syphilis infections if people become infected despite taking antibiotic STI prophylaxis but no longer get tested because they are lulled into a false sense of security. Anyone taking Doxy PEP to reduce the risk of syphilis infection should therefore be tested regularly - gay/bisexual men and trans women every 6 months.

Availability

Doxycycline is a prescription-only medicine in most European Union countries. It is authorised for the treatment of various infectious diseases. These include infections of the gastrointestinal tract, urinary tract infections, respiratory tract infections, skin infections, Lyme disease and other specific infectious diseases. In some countries (not in Germany), the drug is also authorised for the prophylaxis of malaria.

There is no official authorisation for antibiotic STI prophylaxis, meaning that doctors can only prescribe the drug for off-label use in this context. Doxy PEP is usually prescribed on a private

prescription. The cost of a 200mg dose for post-exposure prophylaxis is then around 1.20 euros (prices of around 60 cents can also be obtained via relevant internet search engines). If 200mg tablets are not available in the pharmacy, packs of 100mg tablets can be purchased instead - in this case, two tablets must be taken at the same time within the 24-hour time window to reach the 200mg dose.

Recommendations for counselling

From an epidemiological point of view, antibiotic prophylaxis for syphilis and chlamydia probably only makes sense for a small number of sexually active people, namely those who are active in sexual networks in which syphilis is frequently transmitted. The amount of antibiotics to be taken, especially if taken very frequently over weeks and months, is usually disproportionate to the risk of a generally harmless and asymptomatic infection (chlamydia) or a potentially dangerous but easily treatable infection (syphilis). In its statement, the DSTIG therefore also speaks out against the continuous daily preventive use of doxycycline ('Doxy-PrEP') as a form of antibiotic STI prophylaxis. It also states that the necessary criteria for a medical prescription include belonging to a group for which efficacy has also been proven in studies, i.e. men or trans women who have sex with men **and** are either living with HIV or taking HIV-PrEP.

Nevertheless, there may be understandable reasons for individuals to be interested in antibiotic STI prophylaxis ('Doxy-PEP'). Here are some examples from our counselling practice:

- A person wants to protect their steady partner when an open conversation about outside relationships does not seem possible;
- a person is about to travel to a country where the diagnosis and/or treatment of sexually transmitted diseases is difficult or where stigmatising treatment of gay/queer people is to be expected;
- a person generally has very pronounced fears of a sexually transmitted disease. (*However, repeated safety-seeking behaviour, e.g. through tests or possibly also Doxy-PEP, reinforces fears in the long term rather than reducing them. For counselling, the basic principles for dealing with anxious clients apply here, see ['HIV-related fears of illness. Recommendations for counselling'](#) [DAH 2023]).*

The individual benefit of taking prophylactic antibiotics depends primarily on the likelihood of infection with syphilis or a symptomatic chlamydia infection. The context in which sex takes place (e.g. Chemsex), the number and gender of sexual partners and sexual practices can provide guidance, but above all the extent to which syphilis and symptomatic chlamydia infections have occurred in the past.

When weighing up the benefits, it is always important to consider whether waiting and, if necessary, treatment (if an infection is actually present) is not the better option.

Do not confuse: Doxy-PEP is **not** about prophylactic treatment after sexual contact with people with **diagnosed** syphilis or other STIs (so-called **partner treatment**), but exclusively about the preventive use of doxycycline in people with a high risk of exposure to syphilis/chlamydia. Partner treatment is also sometimes referred to as 'post-exposure prophylaxis', which is why the two are often confused. However, after sexual contact with people with **diagnosed** syphilis or other STIs, other antibiotics are given and/or doxycycline is given over a longer period – a single dose of 200mg doxycycline is not effective in this case.

Counselling and testing are important

We recommend that the decision to take antibiotic prophylaxis for syphilis and chlamydia should always be made after counselling and together with competent doctors (e.g. in HIV specialist clinics).

Anyone using antibiotic prophylaxis should continue regular testing for syphilis, as Doxy-PEP does not offer complete safety. Undetected syphilis can have serious consequences.

Antibiotics or dosage regimens other than those discussed here are strongly discouraged - most antibiotics are ineffective against syphilis and chlamydia.

References

- Molina J-M, *et al.*: Doxycycline prophylaxis and meningococcal group B vaccine to prevent bacterial sexually transmitted infections in France (ANRS 174 DOXYVAC): a multicentre, open-label, randomised trial with a 2 × 2 factorial design. *Lancet Infect Dis* **2024**; Published online May 23
- Werner RN, Schmidt AJ, Potthoff A, Spornraft-Ragaller P, Brockmeyer NH; for the German STI Society (DSTIG). Stellungnahme der Deutschen STI-Gesellschaft zur antibiotischen STI-Prophylaxe mit Doxycyclin (Doxy-PEP, Doxy-PrEP). *JDDG: Journal der Deutschen Dermatologischen Gesellschaft*. **2024**; 22: 466–480. <https://doi.org/10.1111/ddg.15282> (corresponds to the statement of the German STI Society linked above, with updates; **a version in English is also available:** <https://doi.org/10.1111/ddg.15282>)