

COMPARISON OF THE *HANDILAB-C* CHLAMYDIA TRACHOMATIS RAPID TEST DEVICE WITH *PCR* CHLAMYDIA TESTING (*CHLY01_HUN*).

Introduction

Chlamydia trachomatis is the most common sexually transmitted infection. Among women attending STD clinics and other high-risk populations, the prevalence of Chlamydia infection has been reported to be between 15% and 30%, whereas in low-risk populations, such as women attending obstetrics and gynecology clinics, the prevalence is 5% or less. (1, 2) Chlamydia infection is asymptomatic in up to 70% of women who are infected. However it carries the risk of causing infertility. (3, 4)

Commonly used method of diagnosing Chlamydia trachomatis infection is cell culture and PCR. Although PCR has many disadvantages - if performed correctly - it is a very accurate method for diagnosing Chlamydia infection. It can also be used if the bacteria is not alive, but the DNA is intact. That is why some experts prefer PCR versus cell culture, which is very sensitive for transport and storage conditions.

The HandiLab-C test for Chlamydia trachomatis is an enzyme detection system consisting of a substrate, which in the presence of a specific enzyme produced by Chlamydia, causes a reaction. This reaction, coupled to a developer, turns the tip of the swab purple.

Objectives

The objectives of this pilot evaluation are to:

1. Evaluate the ease and acceptability of using the HandiLab device by the patient;
2. Determine the sensitivity and specificity of the HandiLab-C Chlamydia test, carried out on vaginal material by comparing the results with PCR Chlamydia test, carried out on vaginal and endocervical material. The most important objectives of the study were whether HandiLab-C is specific and sensitive enough compared to PCR.
3. To evaluate the prevalence of Chlamydia trachomatis positivity among fertile women in Hungary.

Patients and methods

Patients:

- Number.
- Recruitment will continue until 50 women with positive PCR Chlamydia test on endocervical material are identified.

Inclusion criteria:

- Age: 18 years or over.
- Women who attend the Genito-urinary clinic, who are routinely screened for Chlamydia.
- Written informed consent to participate.

Exclusion criteria:

- Women who are incapable of obtaining their own vaginal specimen and performing the test, e.g. mental or physical disability.

Women who fulfill the inclusion and exclusion criteria were asked to participate in the study. They were given a study information sheet and invited to ask any question about the study and the procedures. If they were willing to participate, they were asked to sign the Consent Form.

Women were asked to collect a vaginal swab specimen and to perform the test, using the *HandiLab-C* device.

Women underwent routine examination following the routine of the clinic.

During the genital examination, the physician collected endocervical material by conventional means, which were sent for PCR analysis. The physician carried out the *HandiLab-C* test as well. All specimens were collected according to clinical judgment and clinical practice.

PCR was performed by GenID, a Hungarian certified laboratory network.

Outcome measures

- 1) Results of the Chlamydia tests on vaginal and endocervical material.
- 2) Questionnaire addressing ease of use and acceptability of the new *HandiLab-C* vaginal material collection tool.

Data management and analyses

All data were collected on the study report forms and questionnaires.

Patients were identified on all study-related documentation only by a unique study number.

Adverse events and comments of the patients were tabulated.

Results of the carried out Chlamydia tests were transferred to a database by a double entry process to minimize errors in data transfer. Tabulation was constructed as follows.

The relative sensitivity and relative specificity were computed for each of the data sets.

Results

1) Samples collected by the physician: vaginal material (with HandiLab-C) versus endocervical material (with PCR).

From all the 197 successful tests 56 positive and 141 negative cases were found by *HandiLab-C*. The outcome with PCR showed 54 positive 143 negative cases.

Table 1.

		PCR test on endocervical material		Total results
		Positive	Negative	
HandiLab-C test on physician-collected vaginal material	Positive	53	3	56
	Negative	1	140	141
Total results		54	143	197

Sensitivity is determined as 53/54 or 98,15%.

Specificity is determined as 140/143 or 97,90%.

Comparing HandiLab-C versus PCR on physician-collected materials is the most sensitive indicator of evaluating the reliability of the detection method of the HandiLab-C rapid test, as shown in the table above.

Results suggest that the enzyme detection system by HandiLab-C is comparable to the method of PCR.

All other comparisons depend on how the patients collect the samples. This is important for home use of the tests, but has no importance if professional use is preferred.

2) *Vaginal samples collected by the patients (with HandiLab-C) versus endocervical samples collected by the Physician (with PCR).*

Table 2.

		PCR test on endocervical material		Total results
		Positive	Negative	
HandiLab-C test on patient - collected vaginal material	Positive	52	3	55
	Negative	2	140	142
Total results		54	143	197

Sensitivity is determined as 52/54 or 96,3%.

Specificity is determined as 140/143 or 97,9%.

This table shows results as "home-use" method of HandiLab-C compared to PCR. Since the HandiLab-C tests were performed by the patients in the doctor's office, it might have improved slightly the success rate.

All together 7 tests could not be carried out correctly, testing has failed. Five of these were the result of minor bleeding after the gynecological examination. If bleeding is present, HandiLab-C fails (color is brown). In two cases patients failed to perform the test, they did not wait ten minutes after the first step. Despite of the 7 cases, most patients declared that they really like the test, it is fast and hygienic.

It is also important to notice, that patients had to carry out the *HandiLab-C* test on their own, gaining information only from the information leaflet included with the test.

3) *Vaginal samples collected by the physician (with HandiLab-C) versus endocervical samples collected by the Physician (with PCR).*

Table 3.

		HandiLab-C test on patient-collected vaginal material		Total results
		Positive	Negative	
HandiLab-C test on physician-collected vaginal material	Positive	55	1	56
	Negative	0	141	141
Total results		55	142	197

Sensitivity is determined as 55/55 or 100%.

Specificity is determined as 141/142 or 99,3%.

As shown in the table, there were only a minor difference between the doctor's collected- and the patient's collected samples. We expected this difference to be higher, which suggests that in some cases some possible verbal help might have been given to the patients in the doctor's office.

Summary

It can be concluded, that *HandiLab-C* can be a powerful tool for detecting Chlamydia trachomatis at home and in gynecologist's offices as well. It is specific and sensitive enough for a first time diagnosis. Before carrying out the test it is important to follow the "patient's information leaflet" very carefully.

II. EASE OF USE AND ACCEPTABILITY OF THE VAGINAL MATERIAL COLLECTION TOOL.

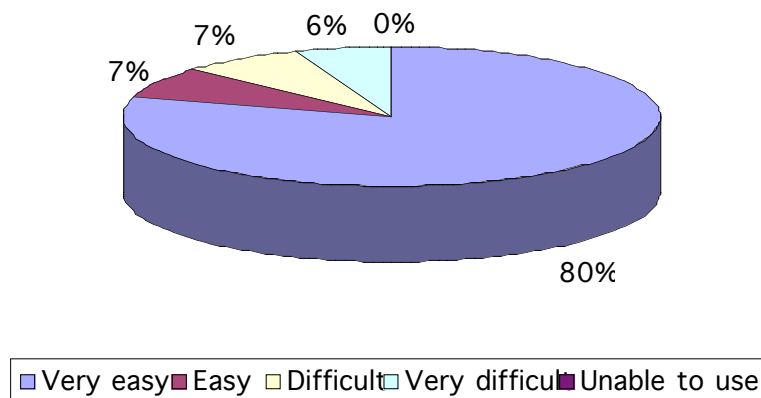
In general, patients were able to use the vaginal material collection tool. It is different to carry out this method at home, or to use it in the doctor's office.

The procedure itself was not difficult for most of the study participants, but swabbing the vaginal wall strongly for receiving cells, was sometimes slightly difficult. Only minor pain was reported even by those patients, who used the swab quite hard for the best result.

Patients had a detailed explanation of what they should do and how they have to manage it, as shown in the leaflet.

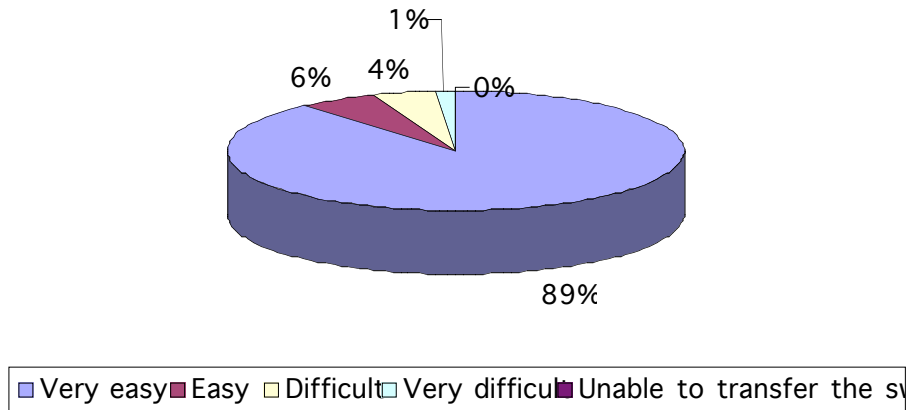
In general, the question **“How easy did you find using the swab”**, most participants have found it very easy. Usually they had no further question when doing the procedure.

How easy did you find using the :



The second part of the procedure was evaluated even with higher satisfaction. Patients had found the “lab part” very easy, evidently hygienic and fast. Breaking the valve, pushing the solution through - that was all done well. The only minor difficulty occurred, when the foil barrier had to be broken through. For the second / third try everybody could manage this part. Some patients were at first afraid to break the swab. Reading the results - looking carefully at the color card (deep purple is only when positive) - did not cause any problem, no further help was needed from the study staff for evaluation.

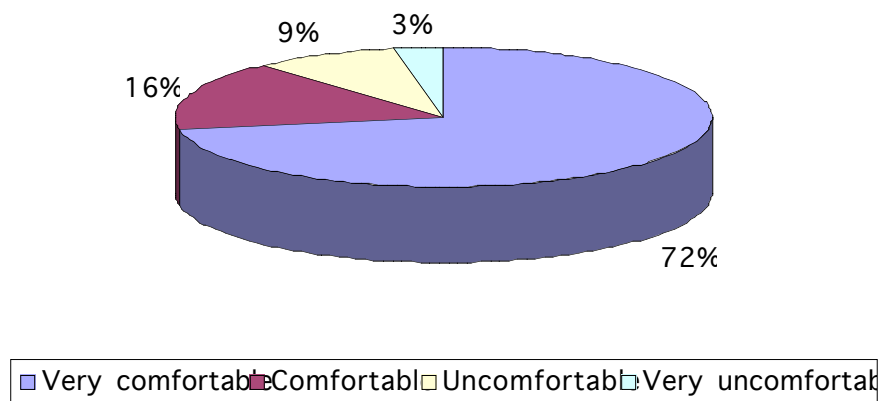
How easy did you find transferring the swab performing the test?



The last question was “How comfortable was using the swab?”

Some woman did not like this question, since according to them to place a medical device into one’s own vagina is not a question of comfort. Only 72% has found it “very comfortable”, 3% has found it very uncomfortable.

How comfortable was using the swab?



Summary

The *HandiLab-C* Rapid Test Device with vaginal swab material was found a good tool for self-testing. Based on the patients participating in this study, *HandiLab-C* can be used easily; sample collection is not painful and can easily be done even at home. Performing the test failed only 7 times during the study, but in a repeated test these patients could perform it as well.

Most patients declared, that they would like to use these kinds of self-tests again, even for other indications / bacteria as well.

III. HOW FREQUENT CHLAMYDIA TRACHOMATIS WAS FOUND IN THE STUDY POPULATION?

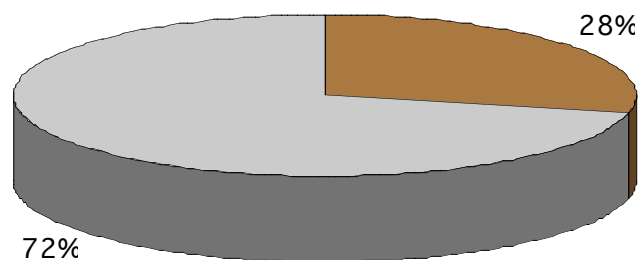
Chlamydia trachomatis is quite widespread in the population. Currently it is more frequent in the US than common cold. (1, 5) In Europe we only suspect, that data can be the same, but in most countries only estimations are available. There are screening programs in some countries, but as in most European countries, there is no organized routine screening for Chlamydia trachomatis in Hungary.

Earlier estimations were based on some studies from the 90's. (6) Later some authors tried to draw conclusions from the high frequency of diseases that may be the consequences of Chlamydia. The proportion of spotting bleeding (Chlamydia is the second cause of this), ectopic pregnancy (Chlamydia is in the background in 43%), tubar infertility (Chlamydia is the no1 cause) shows that the situation is more serious than expected. (5, 7)

As accurate testing methods are getting cheaper and available, the proportion of infected patients (discovered) is getting higher and higher. Some experts in Hungary report that the infection rate is about 30-35%.

Based on this study the following infection rate was found.

Overall result

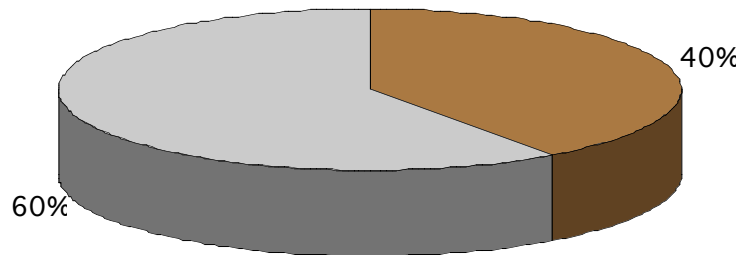


In general, we have found 28% of all cases Chlamydia trachomatis positive. This does not mean new cases, like in most cases of other infectious diseases, since most Chlamydia patients (75% of female, 50% of male patients) have no symptoms at all and can live together with the bacteria for decades.

This percentage is relatively high, compared to expected, but if we take into consideration the frequency of spotting, ectopic pregnancy and female infertility in Hungary – this number seems to correspond as well.

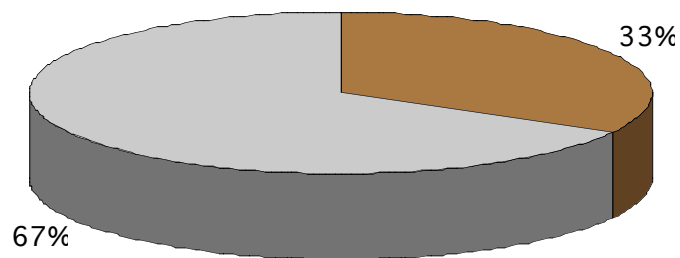
If we divide the results into age groups, the following is found;

Under 20 years of



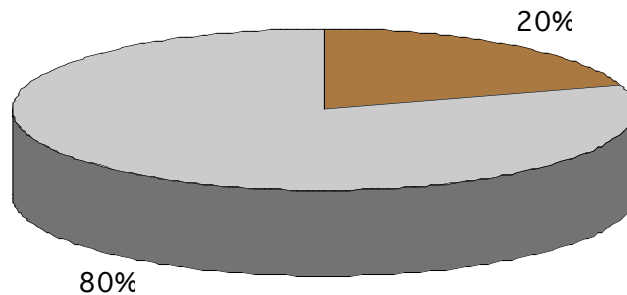
We had a limited number of patients in this age group, but 6 positive from 15 is a frightening result. Of course, with this low number it can be accidental, but a good base for second thoughts. In international studies others had found the highest rates in this subgroup as well.

Between 20-30 y



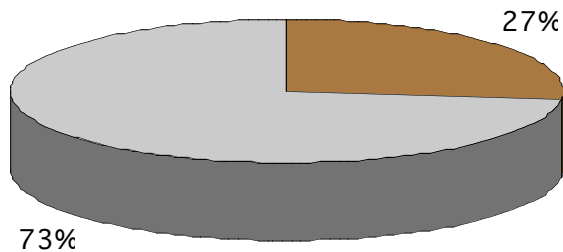
This age group is still above average, from 87 patients 28 was found positive. These are young women, who change partners quite frequently, trying to find a final partner or husband. Most of them use pills instead of condoms, and they do not know much about sexually transmitted diseases.

30-40 years of



This age group is under the average; this is the part of the population who lives in marriage, or established partnership, have usually one or two partners. They also take much more care than others; sexual hygiene is more important. After delivering their children they keep in touch with their gynecologists, go to regular visits and take antibiotics for different reasons at least 2-3 times a year. The infection rate is still quite high.

Above 40 years of



The 37 patients above 40 years of age were varying a lot in age, from 70 to 41. Ten of them were found infected with Chlamydia, usually the younger ones. The number of this group is quite low for drawing conclusions. This high number of infected cases can be accidental.

Generally women in their early reproductive age (under 33 years old) had higher rate of infection.

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