Molecular detection and prevalence of mycoplasmas, ureaplasmas and \textit{Chlamydia trachomatis} in human urogenital tract – cross-sectional study

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\section*{Introduction}
Human urogenital tract is colonized by large variety of microorganisms which are the part of normal flora. There are also STI/STD (sexually transmitted infections/diseases) pathogens presented in the flora which may be involved in aborts, premature births and infertility. We performed study on potentially asymptomatic people in order to determinate prevalence of \textit{M. genitalium}, \textit{M. hominis}, Ureaplasma spp. and \textit{C. trachomatis} in urogenital tract of sexually active people. In addition to conventional clinical samples, we tested self-sampling device Evalyn® Brush which is usually used for vaginal cell material collection for HPV detection.

\section*{Material and methods}
The real-time PCR assay (GeneProof a.s.) was used to determine the prevalence of \textit{M. genitalium}, \textit{M. hominis}, \textit{Ureaplasma} spp. and \textit{C. trachomatis} in different types of specimens, i.e. vaginal swabs, penis swabs and urine. The study was performed on 104 women and 29 men. Vaginal swabs were acquired by FLOQswabs™ sampling and also by self-sampling device Evalyn® Brush (Medical Rovers Devices B.V.). Penis swabs were acquired by FLOQswabs™. DNA of the pathogens was extracted by croBEE Nucleic Acid Extraction System (GeneProof a.s.).

\section*{Results}
\textbf{Clinical material examination}
Overall 176 various clinical samples from 133 patients were examined in this study. The STI/STD pathogen positivity was found at 48 \% (n=85) of all clinical samples.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{distribution.png}
\caption{Distribution of STI/STD pathogens}
\end{figure}

The co-infection was found out in 11 \% of all positive samples. Ureaplasmas were detected in all co-infected samples always with one other STI/STD pathogen. \textit{M. genitalium} was not detected in any clinical sample.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{co-infection.png}
\caption{Co-infection}
\end{figure}

\textbf{Clinical status linkage}
The clinical questionnaire was enclosed to informed consent. Clinical symptoms were reported by 29 \% respondents. One person could have more clinical symptoms.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|}
\hline
\textbf{CLINICAL SYMPTOMS} & \textbf{WOMEN (n)} & \textbf{MEN (n)} \\
\hline
pain during urination & 1 & 0 \\
pain in the lower abdomen & 13 & 0 \\
increased need to urinate & 7 & 2 \\
pain during sex & 5 & 0 \\
itchy genitals & 10 & 1 \\
inflammation in the genital area & 4 & 0 \\
vaginal discharge & 12 & 0 \\
penis discharge & 0 & 0 \\
anal discharge & 0 & 0 \\
inflammation of the rectum & 1 & 1 \\
\hline
\end{tabular}
\end{table}

One sixth of patients with symptoms had detected pathogens.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{pathogens.png}
\caption{Pathogens detected in symptomatic patients}
\end{figure}

\section*{Discussion & Conclusion}
We analyzed that women consider many clinical symptoms as normal. Every women who had the \textit{C. trachomatis} detected, had particular clinical symptoms mainly vaginal discharge. Nevertheless, these women considered their symptoms as a normal and did not visited the clinicians. Self-sampling device Evalyn® Brush seems to be a potentially adequate sampling device for STI/STD professional laboratory testing. We proved that Evalyn® Brush could be valuable sampling system for women who are not able to visit gynecologists.