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EVALUATION OF VOLATILE ORGANIC COMPOUNDS IN THE DIAGNOSIS OF CHLAMYDIA

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Abstract:
Currently, there are various methods for diagnosing sexual infections, which differ in sensitivity, ease of use and accessibility. Experience in the treatment of sexually transmitted infections shows that the appointment of diagnostic measures and necessary tests to detect the disease requires an individual approach and the development of new, more informative Express methods.
Goal: *To investigate easily volatile organic compounds of various classes characteristic of a certain type of sexually transmitted infections.*
Many STI pathogens, multiplying in the nutrient medium of the mucous membranes of the internal genitals, emit light-volatile organic compounds of various classes, including alcohols, aldehydes, carboxylic acids, aliphatic and aromatic amines, etc.These compounds can be considered marker gases and their presence in the test sample indicates the development of the disease. The most frequently diagnosed STIs are characterized by individual odor secretions and the composition of the equilibrium gas phase (RGF) above them.
It is possible to use the method of piezo-quartz micro weighting, based on the selective absorption of STI marker gases by thin highly specific films-modifiers of piezo – quartz resonators.
Keywords: *marker gases, chemical piezosensors, bioassays, cervical mucus, electronic nose*

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ANNOTATION:

Currently, there are various methods for diagnosing sexual infections, which differ in sensitivity, ease of use and accessibility. Experience in the treatment of sexually transmitted infections shows that the appointment of diagnostic measures and necessary tests to detect the disease requires an individual approach and the development of new, more informative Express methods.

Goal: To investigate easily volatile organic compounds of various classes characteristic of a certain type of sexually transmitted infections.

MATERIAL AND METHODS:

The study included 55 patients, 25 of whom were diagnosed with chlamydia infection. All patients were examined clinically, and specific tests for bacterial and / or viral infection were performed using the following methods:

1. Microscopic-bacterioscopy of a smear from the cervical canal and vagina;
2. Culture (seeding) - with automatic counting on an automated bacteriological analyzer with isolation of resistance mechanisms;
3. Serological - enzyme-linked immunosorbent assay (ELISA);
4. Molecular biology-polymerase chain reaction (Real-time PCR).

The presence of chlamydia infection was confirmed by laboratory methods.

All patients were divided into two groups: the control group - "clinically healthy" - 30 people and the main group - having STIs - 25 people (with chlamydia infection). The average age was 32.7 ± 3.2 years. The control group consisted of 20 healthy individuals with an average age of 27.9 ± 1.8 years. Bioprobes (the composition of the equilibrium gas phase over the cervical mucus) were examined in all patients.

RESULTS AND DISCUSSION:

Many STI pathogens, multiplying in the nutrient medium of the mucous membranes of the internal genitals, emit light-volatile organic compounds of various classes, including alcohols, aldehydes, carboxylic acids, aliphatic and aromatic amines, etc.These compounds can be considered marker gases and their presence in the test sample indicates the development of the disease. The most frequently diagnosed STIs are characterized by individual odor secretions and the composition of the equilibrium gas phase (RGF) above them (table. 1).

Table 1: Gases-markers of tested diseases

Diagnostic assessment	Odour emissions	Gas markers in the RGF
Norm	No	Oxy Acid
Candidiasis (C)	Yeast	Monatomic alcohols, aldehydes, carboxylic acid
Gardnerellosis (G)	Fishy	Aliphatic amines, isonitriles
Chlamydia (Ch)	No	Monatomic alcohols
Trichomoniasis (T)	Unpleasant	Aliphatic and aromatic amines
Micoplasmosis (M)	No	not installed
Ureaplasmosis (U)	No	not installed
The human papillomavirus (VPH)	No	not installed

CONCLUSION:

One of the ways to implement STI diagnostics is to use innovative developments that combine the simplicity of the analysis and decision-making methodology with a sufficiently high sensitivity and specificity. The results of the microbiological study and PCR are confirmed by the data obtained using the proposed method. Thus, for the diagnosis of STIs, it is possible to use the method of piezo-quartz micro weighting, based on the selective absorption of STI marker gases by thin highly specific films-modifiers of piezo – quartz resonators.

REFERENCES:

1. *Revelsky A.I., Revelsky I.A., Miller B., Oriedo V.* Simultaneous determination of fatty, dicarboxylic and amino acids based on derivatization with isobutyl chloroformate followed by gas chromatography – positive ion chemical ionization mass spectrometry //J. Chromatogr. B. 2004. V. 800. № 1–2. P. 101.
2. Sukharev A., Yermolaeva T. N., Beda N. A., Mamaeva S. A., Yermolaev V. G. Immunochemical study of lactoferrin, products of fibrinogen degradation, immunoglobulins and protein fractions in mixed saliva a promising non-invasive test in assessing the state of health during medical examination / / Modern science-intensive technologies. 2006. No. 6. P. 79.
3. *Pavlou A.K., Magan N., McNulty C., Jones J.M., Sharp D., Brown J., Turner A.P.F.* Use of an electronic nose system for diagnoses of urinary tract infections// Biosens. Bioelectron. 2002. V. 17. № 10. P. 893.
4. Bernabei M., Pennazza G., Santonico M., Corsi C., Roscioni C., Paolesse R., Di Natale C., D'Amico A. A preliminary study on the possibility to diagnose urinary tract cancers by an electronic nose // Sens. Actuators B: Chem. 2008. V. 131. № 1. P. 1.
5. Belsky V. E. Solubilization of gases and saturated vapors in biological media. Chem.- farm. journal. 2000. Vol. 34. No. 11. P. 42.
6. . Buszewski B., Ulanowska A., Kowalkowski T., CieslinskiK. Identification of volatile lung cancer markers by gas chromatography-mass spectrometry: Comparison with discrimination by canines // Anal. Bioanal. Chem. 2012. V. 404. № 1–2. P. 141.
7. Gaspar E.M., Lucena A.F., Duro da Costa J., Chavesdas Neves H. Organic metabolites in exhaled human breath – A multivariate approach for identification of biomarkers in lung disorders // J. Chromatogr. A. 2009. V. 1216. № 14. P. 2749.
8. Gardner J.W., Shin H.W., Hines E.L. An electronic nose system to diagnose illness // Sens. Actuators B: Chem. 2000. V. 70. № 1–3. P. 19.
9. Kuchmenko T. A., Shuba A. A., Tyurkin I. A., Bityukova V. V. Assessment of the state of biological samples based on the composition of the equilibrium gas phase with the use of a multisensory system. analyte. chemistries. 2014. Vol. 69. No. 5. P. 534. (Kuchmenko T.A., Shuba A.A., Tyurkin I.A., Bityukova V.V. Estimation of the state of biological samples by the composition of the headspace using a multisensor system. // J. Analyt. Chem. 2014. V. 69. № 5. P. 485.)
10. Weiss T., Angerer J. Simultaneous determination of various aromatic amines and metabolites of aromatic nitro compounds in urine for low level exposure using gas chromatography–mass spectrometry // J. Chromatogr. B. 2002. V. 778. № 1–2. P. 179.
11. Deng Y.-H., Wang H., Zhong L., Zhang H.-S. Trace determination of short-chain aliphatic amines in biological samples by micellar electrokinetic capillary chromatography with laser-induced fluorescence detection // Talanta. 2009. V. 77. № 4. P. 1337.
12. Rudnicka J., Kowalkowski T., Ligor T., Buszewski B. Determination of volatile organic compounds as biomarkers of lung cancer by SPME–GC–TOF/MS and chemometrics // J. Chromatogr. B. 2011. V. 879. № 30. P. 3360.
13. Senthilmohan S.T., Kettle A.J., McEwan M.J, Dummer J., Edwards S.J., Wilson P.F., Epton M.J. Detection of monobromamine, monochloramine and dichloramine using selected ion f low tube mass spectrometry and their relevance as breath markers // Rapid Commun. Mass Spectrom. 2008. V. 22. № 5. P. 677.
14. Carrola J, Rocha C.M., Barros A.S., Gil A.M., Goodfellow B.J., Carreira I.M., Bernardo J., Gomes A., Sousa V., Carvalho L., Duarte I.F.. Metabolic signatures of lung cancer in biofluids: NMR-based metabonomics of urine // J. Proteome Res. 2011. V. 10. № 1. P. 221.