

GYNE-VOX: Clinical study for the analysis of volatile organic compound profiles for endometrial cancer screening.

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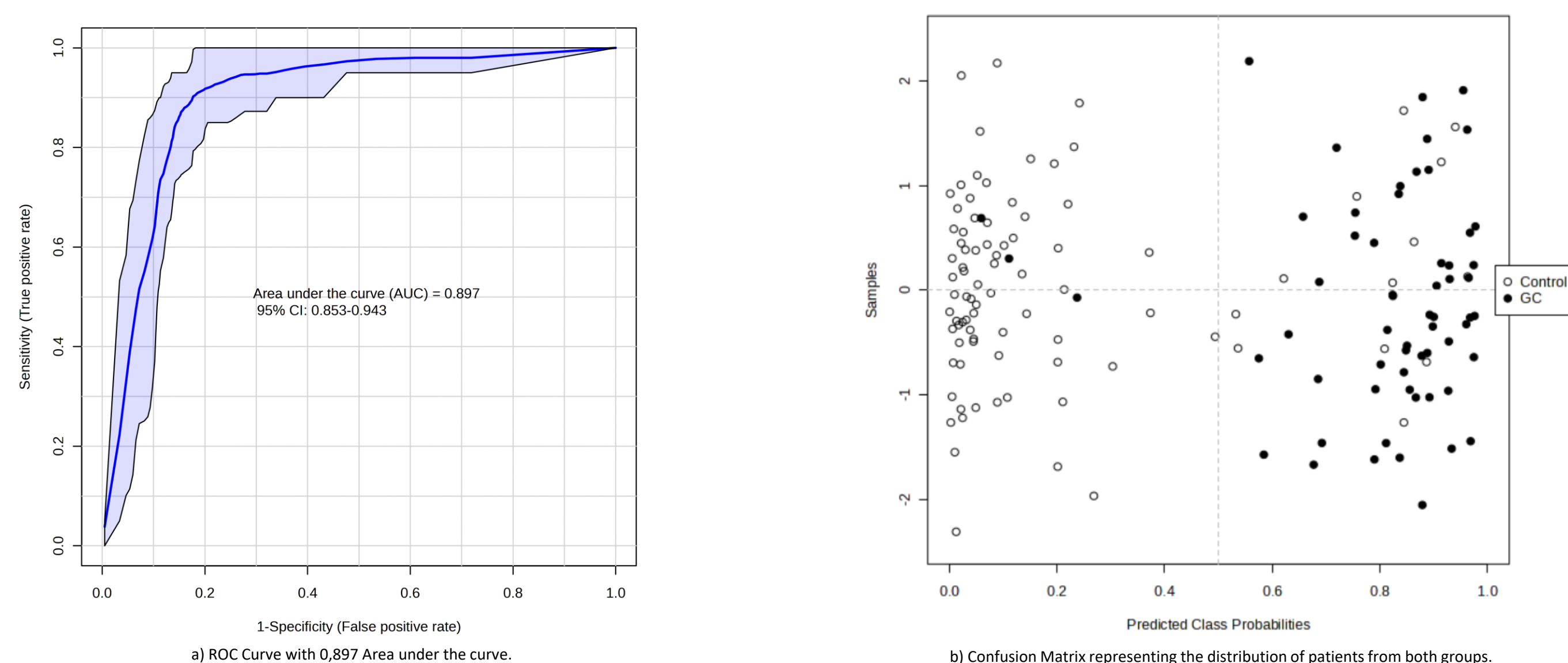
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Introduction

Endometrial cancer is the most prevalent gynecological cancer in Western countries, probably due to its association with several factors such as Diabetes, Arterial Hypertension and Obesity. The incidence is increasing not only in the developed world, where case numbers have more than doubled in the last 20 years but is also expected to increase in lower income countries as the global burden of obesity worsens ^[1]. In line with this, mortality rates are also increasing, albeit to a lesser extent. The 5-year relative survival rate is estimated to be 83% ^[2]. However, these rates vary drastically across cancer stage and histologic subtype, from 95% for patients with localized disease compared with <20% among women with distant spread. Endometrial deaths have increased steadily by approximately 20% over the past decade. If current trends continue, the incidence of endometrial cancer is expected to double by 2030, and deaths from endometrial cancer will soon surpass those from ovarian cancer ^[3]. An efficient screening would save lives.

All cancer cells are characterized by a change in their metabolism related to their uncontrolled growth. As such, the detection of metabolites resulting from this metabolic activity (which directly reflect the current state of cells, tissues and the microbiome) could be an innovative tool in the early screening/diagnosis of these gynecological cancers. Many of these metabolites are volatile, being called Volatile Organic Compounds (VOCs). Our study aimed to establish the use of a technique for the analysis of VOCs present in exhaled breath air, performed in a completely non-invasive way, in a population of patients with clinical suspicion of endometrial cancer to screen these pathologies, complementing the usual laboratory, radiological and pathological anatomy diagnostic techniques.^[4] A confusion matrix was obtained, presenting values above 80% for Sensibility, Specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV) and Accuracy. This allowed association of the respiratory profiles with each group of volunteers for screening of endometrial cancer in women.

• STATISTICAL RESULTS

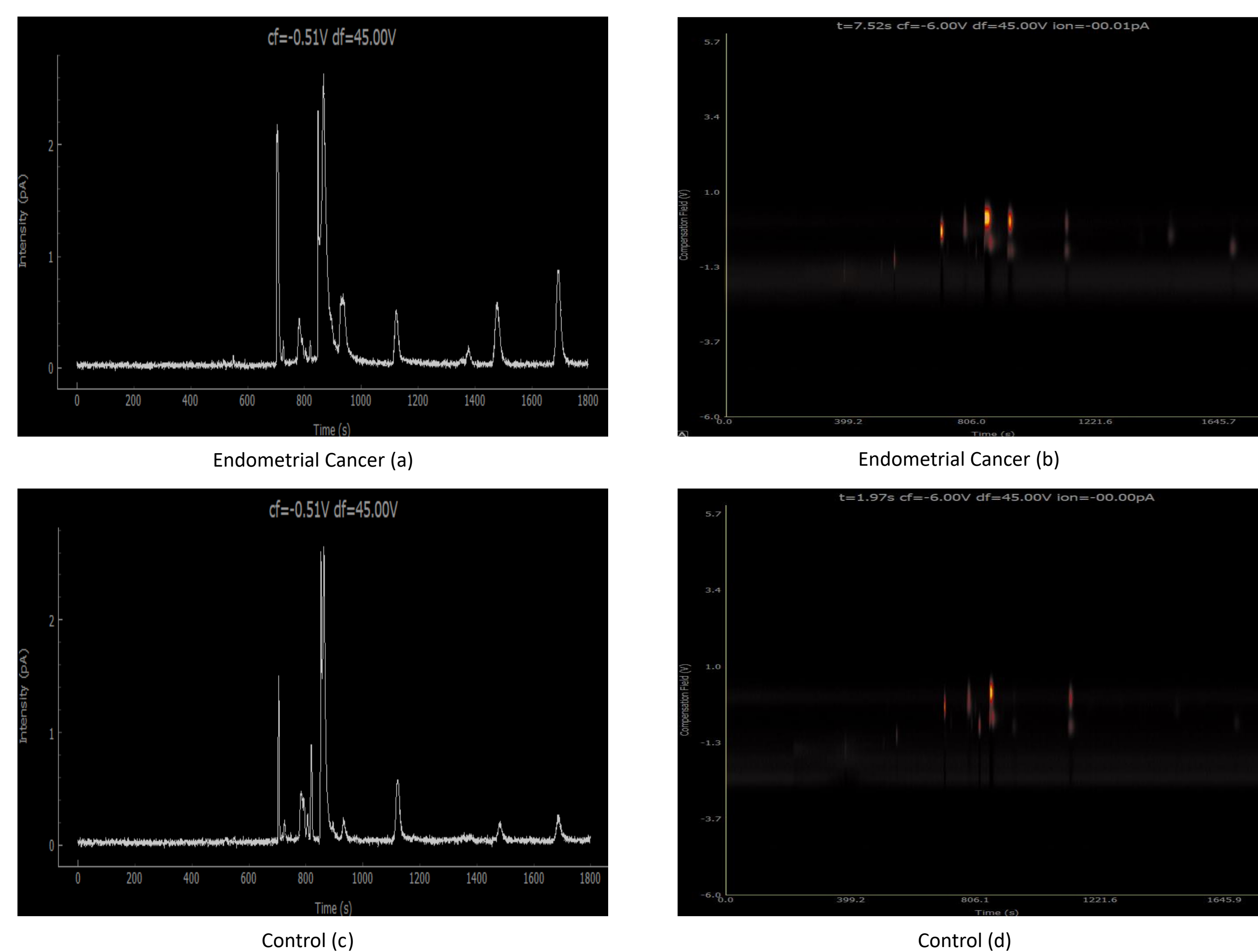


Sensitivity	95%
Specificity	85%
Positive predictive value	81%
Negative predictive value	96%
Accuracy	89%

c) Statistical values for validation of the method.

- The Area Under the Curve is situated at 0.897, which is a very good value to work with.
- Looking at b), it is noticeable the difference between the two groups, even though we have some missed placed values.
- In Table 1, c), the statistical values are all above 80%, with the Sensitivity of the method and PPV above 95%.

• DATA



- It is possible to observe the differences between the two groups. In the patients group, a) and b) we have more peaks and peaks with different intensity when compared with the control group, c) and d).

• BREATH COLLECTION PROTOCOL



a) Breath collection

b) TD tube sampling

c) Sample analysis by Gas-Chromatography and detection by Mass Spectrometry.

• CONCLUSIONS

- Looking at the results that we obtained, we can say that this method for diagnosing Endometrial Cancer is very promising.
- Although it requires more analysis and more people to enrol in the study, we can be very hopeful to achieve a new non-invasive method to diagnose Endometrial Cancer.

References:

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Acknowledgements

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