

Extended Abstract

Salivary Metabolic Analysis in Healthy Subjects and Perspectives for Patients with Oral Cancer: Pilot Study and Systematic Review [†]

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1. Introduction

Oral squamous-cell carcinoma, the most frequent malignant neoplasm of the oral cavity, has a poor 5 years survival rate.

The identification of specific salivary biomarkers can lead to a reduction of diagnostic delay.

The aims of the present work are:

1. to report the results of a pilot analysis on metabolic salivary composition of 20 healthy subjects.
2. to perform a systematic review designed to answer to the question: “Is there evidence that support the use of salivary metabolomics for diagnosis of OSCC?”

2. Materials and Methods

Pilot study. Twenty healthy subjects (10 males and 10 females) aged between 20 and 25 years were included. Enrolled subjects underwent a thorough dental examination, in order to assess the presence of inflammatory and/or infectious conditions in the oral cavity, which could interfere with the composition and analysis of saliva.

Whole saliva (WS) and blood were collected at Centro Universitario di Odontoiatria in Parma. The metabolic profile of biofluids was determined by proton nuclear magnetic resonance (¹H-NMR) in a JEZ 600 MHz ECZ600R spectrometer at the Interdepartmental Center for Measurements (CIM) of the University of Parma.

The systematic review was performed searching Medline, Scopus and Web of Science, using as entry terms a combination of “saliva” or “salivary biomarkers” and “oral carcinoma”, “oral cancer”, “squamous cell carcinoma”, “salivary metabolomics”. endpoint of research was generally 2019. The quality of the studies was assessed by two independent reviewers based on the checklist proposed by the National Institute of Health (NIH). The level of evidence was assessed using the Oxford Center for Evidence-Based Medicine (CEMB) classification.

3. Results

The salivary metabolic analysis identified and quantified over 50 metabolites. Acetate was found to be the metabolite with the highest concentration, both in males and females (Figure 1).

Comparing acetate with the second most concentrated metabolite (propionate) the first has a presence 9.5 times higher than the second.

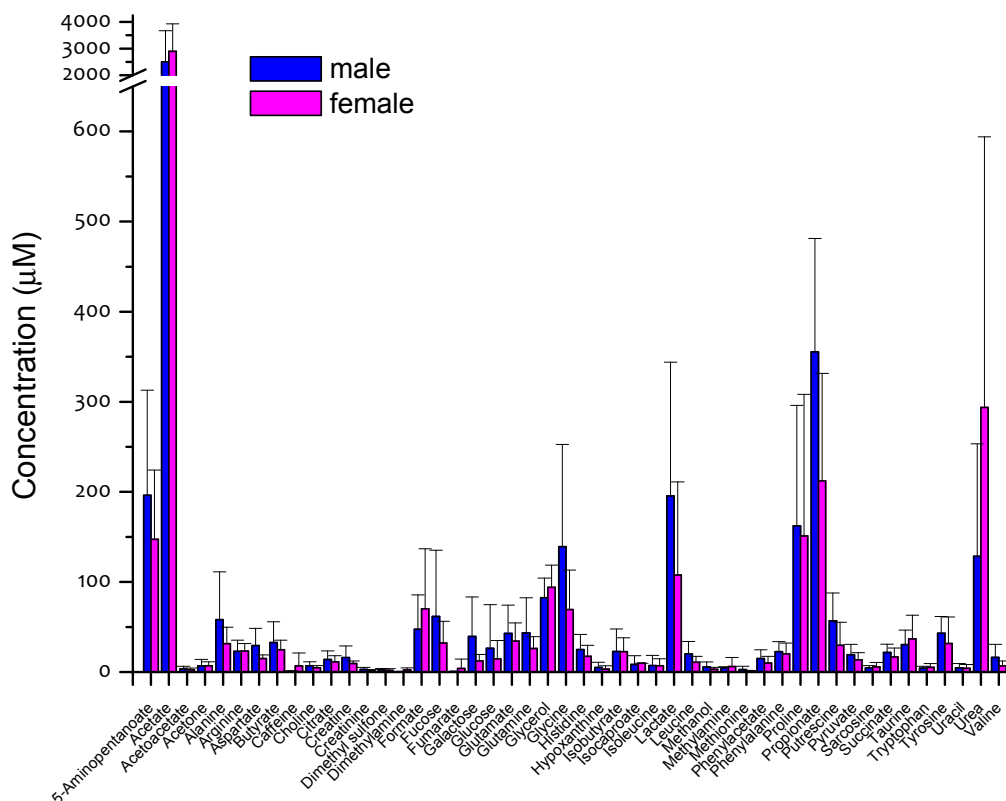


Figure 1. Salivary concentration of identified metabolites divided by gender.

Thirteen papers out of 4198 fulfilled the inclusion criteria. No article obtained a “good” rating (0/13, 0%), 12 articles were classified as “fair” (92%) and 1 article as “poor” (8%).

Most frequent risks of bias were the lack of sample size justification, the absence of concurrent controls, the choice to not blind the status of participants by the investigators.

According to the CEMB classification the 13 articles have a low level of evidence (level 4). Most frequently investigated metabolites that revealed a strong association with OSCC were: pyruvic acid, glycine, proline and choline.

4. Conclusions

Metabolic analysis of saliva is one of the most promising field for early diagnosis oral squamous cell carcinoma.

The present study demonstrates the salivary metabolic composition of healthy subject and may serve as a reference to elucidate saliva alteration found in patient with malignant tumours.

Conflicts of Interest: The authors declare no conflict of interest.



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