

Detection of Secretory Leukocyte Protease Inhibitor as a potential salivary biomarker of head and neck squamous cell carcinoma

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Background

Salivary biomarkers are an emerging diagnostic tool for the detection of head and neck squamous cell carcinomas (HNSCC). Secretory Leukocyte Protease Inhibitor (SLPI) is a neutrophil elastase expressed by squamous epithelium and a key component of the innate immune response to viruses, including the human papilloma virus (HPV). Previous studies have shown that SLPI is downregulated in oropharyngeal squamous cell carcinoma (OPSCC) tissue and may be associated with an increased risk of developing HNSCC. This study aims to demonstrate the feasibility of detecting SLPI as a salivary biomarker for HNSCC.

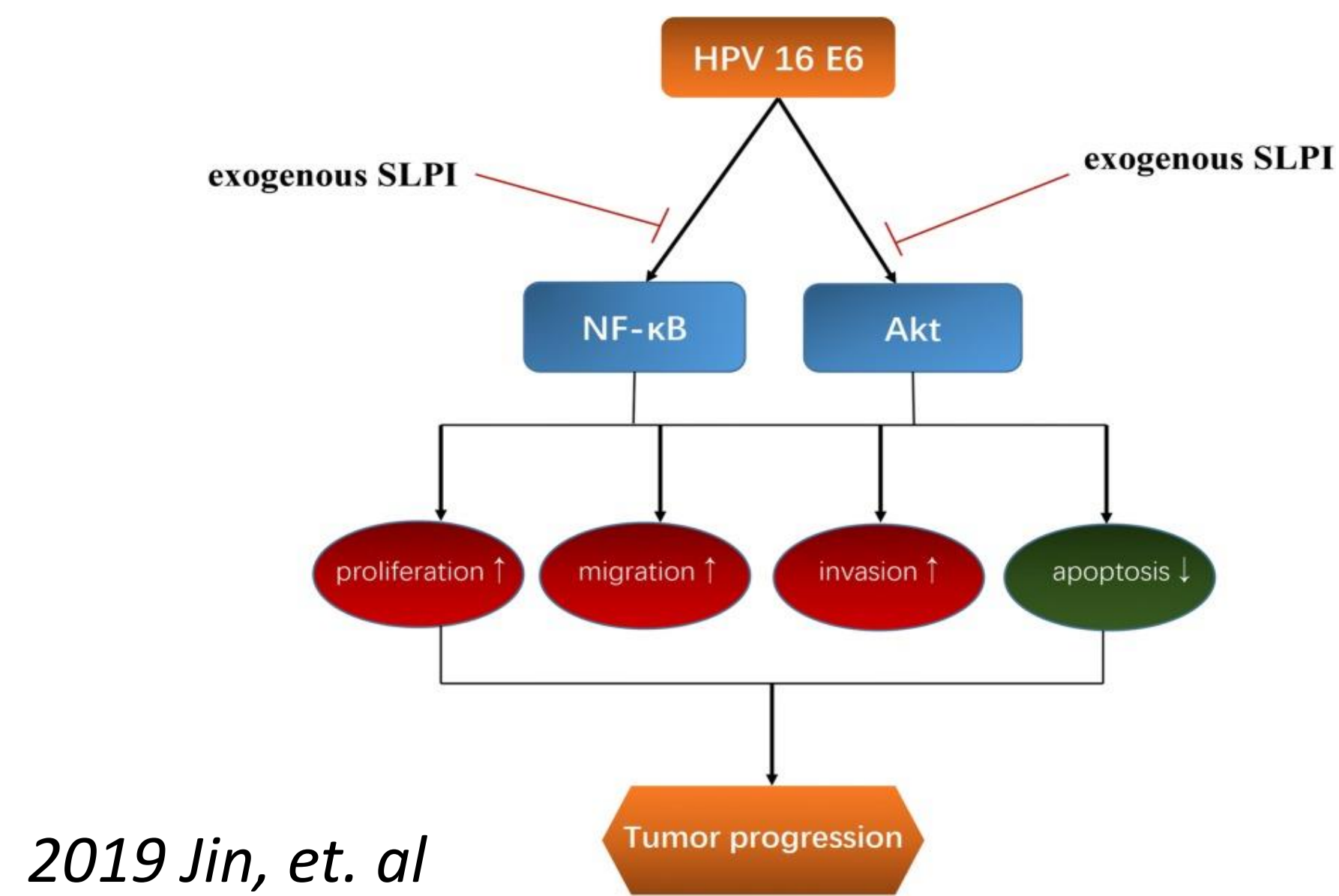


Figure 1: SLPI is a neutrophil elastase inhibitor in squamous cells. It downregulates signal transducers that are essential for viral infection by HPV

Materials and Methods

Study Design: Prospective cohort study at a single academic institution between October 2018 – December 2019

Saliva samples were collected from patients with OSCC (n=10), OPSCC (n=7) and healthy controls (n=9). Saliva samples were assayed for SLPI protein by indirect enzyme-linked immunosorbent assay (ELISA). Bradford assays were conducted to determine total protein concentrations in saliva for normalization.

Results

Table I. Study Population Characteristics (n = 26)			
Patients (n = 17)		Controls (n = 9)	
Age, median (SD)	63 (12.6)	Age, median (SD)	46 (14.4)
Sex, n (%)		Sex, n (%)	
Female	3 (17.6)	Female	5 (55.6)
Male	14 (82.4)	Male	4 (44.4)
Race, n (%)		Race, n (%)	
White	8 (47.1)	White	6 (66.7)
Asian	2 (11.8)	Asian	1 (11.1)
Hispanic	4 (23.5)	Hispanic	2 (22.2)
Other	1 (5.9)	Other	-
Refused	2 (11.8)	Refused	-
Smoking, n (%)		Smoking, n (%)	
Current	3 (17.6)	Current	-
Former	4 (23.5)	Former	5 (55.6)
Never	9 (52.9)	Never	4 (44.4)
Did not respond	1 (5.9)	Did not respond	-
Alcohol use, n (%)		Alcohol use, n (%)	
Current	5 (29.4)	Current	6 (66.7)
Former	3 (17.6)	Former	2 (22.2)
Never	5 (29.4)	Never	1 (11.1)
Did not respond	4 (23.5)	Did not respond	-

Table 1: There were 17 patients and 9 controls in this sample. The rate of non-smokers was similar between the groups. Alcohol use differed between the patients and controls.

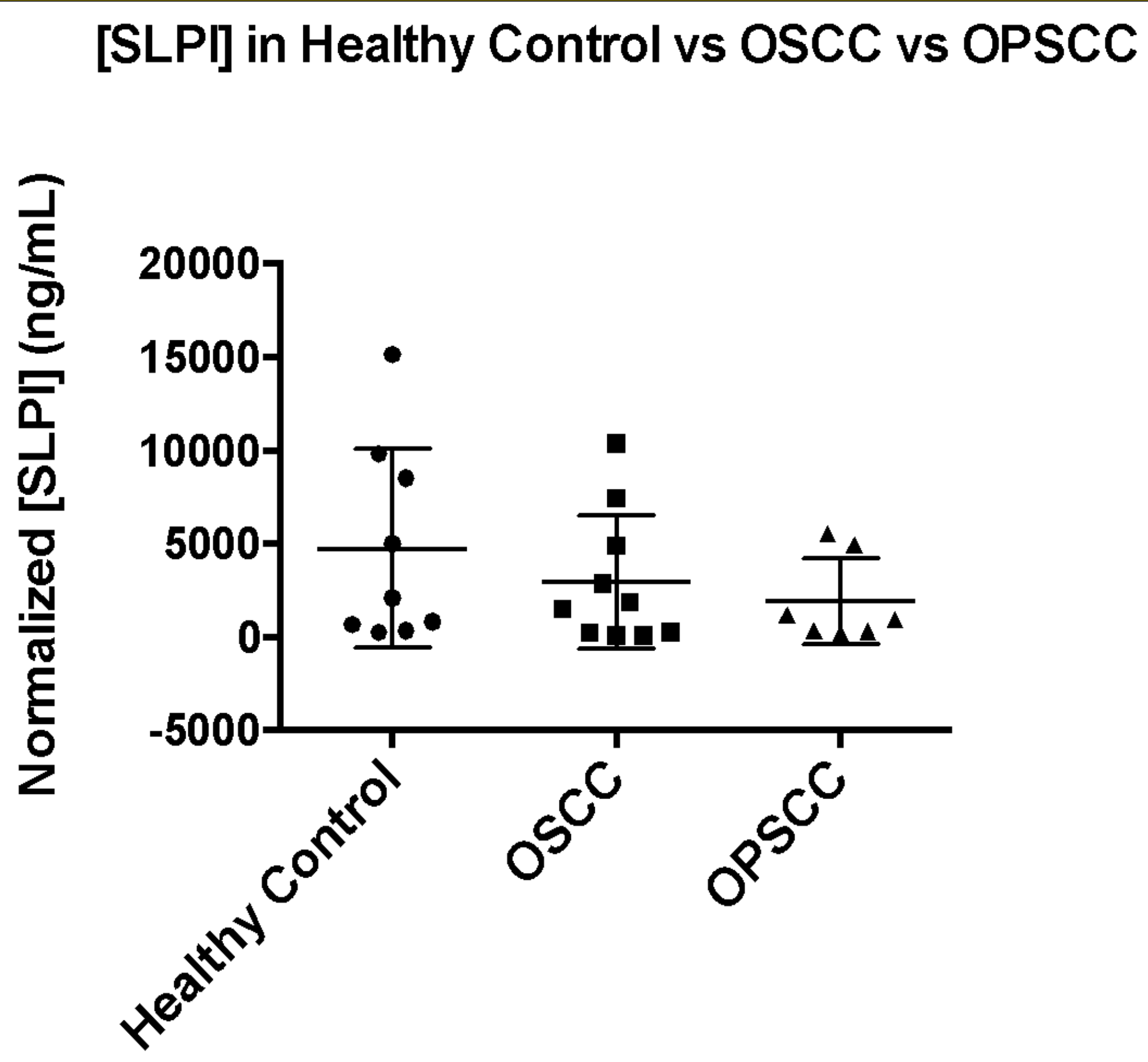


Figure 2: Healthy controls had higher concentrations of SLPI in saliva compared to HNC patients, with and without stratification by location of SCC. However, there was no statistical significance between the groups.

The median normalized SLPI levels were greater in healthy controls (2089 ng/mL, range: 263.3 - 15157 ng/mL) compared to patients with OSCC (1685 ng/mL, range: 70.80 - 10365 ng/mL), and OPSCC (957.0, range: 229.5 - 5575 ng/mL). Despite this, no statistically significant differences in SLPI levels were noted between healthy controls and cancer patients (p=0.171, Mann-Whitney U), regardless of the type of cancer (p = 0.445, Kruskal-Wallis).

Discussion

Salivary SLPI levels in this pilot study were not predictive of disease status. However, the study sample size is limited. Over 30 additional patient samples have been collected and further testing will be performed. Future analysis will also control for other variables shown to affect SLPI expression levels such as smoking status and age. Additionally, laryngeal and pharyngeal cancer patients must also be examined for SLPI expression. These studies will clarify the utility of SLPI as a potential salivary biomarker for head and neck squamous cell cancer.

References

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