

Survival machine learning algorithms in patients with oral tongue squamous cell carcinoma

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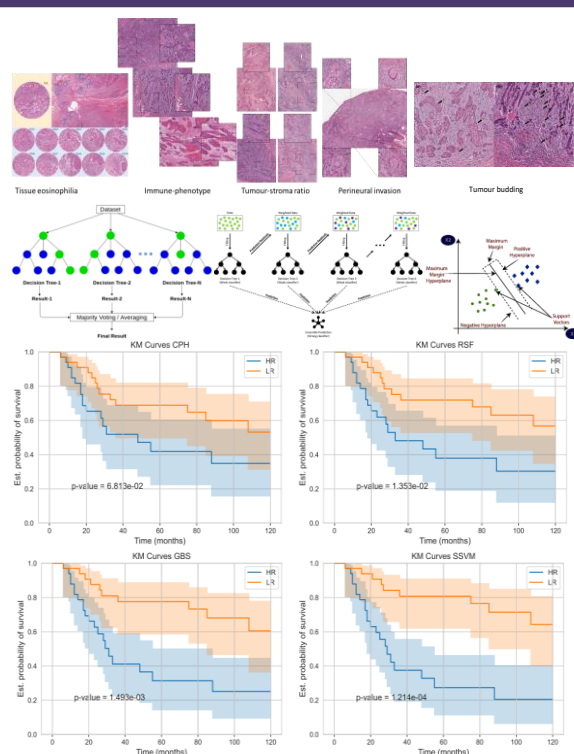
OBJECTIVES

Employment of machine learning (ML) algorithms is becoming more common in medical decision-making. Oral cavity can be affected by neoplasms and the most common involved subsite and histological type is oral tongue squamous cell carcinoma (OTSCC). To predict long-term patients' related outcomes, TNM staging system represents the gold-standard risk stratification system ¹. Despite recent updates in TNM classification system, patients within the same TNM stage can display differential prognoses. Our understanding of cancer might improve thanks to the application of ML ². Hence, we tested 4 different ML based survival models to predict disease-specific survival in patients with OTSCC.

METHODS

A total of 21 clinical and pathological features were retrospectively identified by revising paraffin-embedded tissues and clinical charts. These variables included some new pathological variables, described previously by our group ¹⁻⁴. The four different ML algorithms included Survival Support Vector Machine (SSVM), Cox Proportional Hazard (CPH), Gradient Boosted Survival (GBS) and Random Survival Forest (RSF). Python was employed for analysis.

GRAPHS & TABLES



RESULTS

Final analysis showed a Hazard Ratio of 4.36 (95%C.I. 2.91 – 7.04, p-value<0.001) for DSS attributed to the SSVM algorithm that outperformed the other models (C-index=0.69).

REFERENCES

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CONCLUSION

Our preliminary results indicate the promising application of ML algorithms in combining clinical and pathological information. These tools might be employed to highlight patients with higher risk of adverse outcomes based on their particular characteristics, which are not, in the last TNM staging release, not included, leading to its improvement.