#IRB2024-233

Analyzing Salivary Statherin Concentration as a Marker for Overall Oral Health

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OBJECTIVES

Aim 1

We collected unstimulated saliva at different times of the day and analyze each sample for differences in statherin concentration. Our hypothesis is that the time of day during which saliva is collected may affect the statherin concentration.

Aim 2

We compared statherin concentration in saliva collected while participants are simulated to produce saliva and during an unstimulated state. Unstimulated and stimulated saliva pools are different in protein and chemical composition. The differences can be attributed to the contribution of specific salivary glands to the saliva composition. Statherin is produced from the submandibular and parotid salivary glands. Our hypothesis is that stimulation will produce saliva that has a higher concentration of statherin.

Aim 3

We compared statherin concentration with the biostatistics of each participant. This analysis will provide information on how such factors may affect statherin concentration and establish a baseline level of statherin in saliva. The parameters include age, gender, level of estrogen (in female participants).

METHODS

Participants in the study were young, healthy male and female adults (ages 18–30) from the University of the Pacific Dental School. Saliva samples were collected at various times of the day. Samples were centrifuged to remove undissolved particles. Molecular analysis of statherin concentration was conducted using western blots. Total protein levels in the saliva samples were measured using a bicinchoninic acid assay. Participants also completed anonymized questionnaires covering demographics, general health, and self-reported glycemic status.

RESULTS

Statherin concentration in saliva exhibited clear fluctuations throughout the day. Normalized values were lowest in the early morning (08:30 AM) and showed peaks at mid-morning (10:00 AM) and late morning to early afternoon (12:00 PM). A secondary rise was observed around 09:00 PM. These patterns suggest a non-linear diurnal variation. Significant intra-timepoint variability was also noted, indicating individual differences or possible influence from uncontrolled variables such as hydration or food intake, especially for 3:00 PM and 9:00PM time collections.

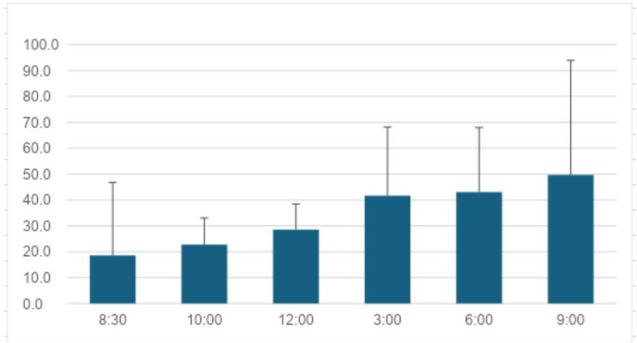

Figure 3. This graph represents Statherin concentration levels at different times of day and their standard deviations of those values. It is the average of our samples across 3 different days.

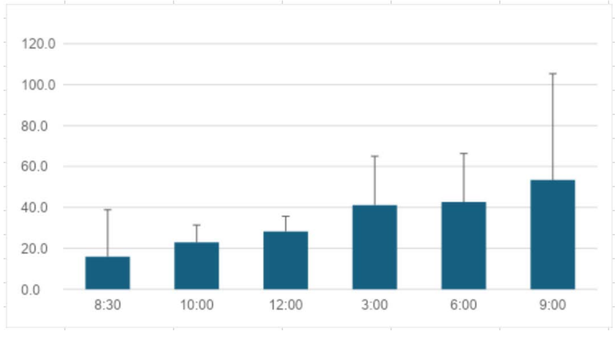

Figure 4. This graph represents Statherin concentration levels at different times of day and their standard deviations of those values, normalized to the day average, presuming that the same person should have the same average of Statherin in one day.

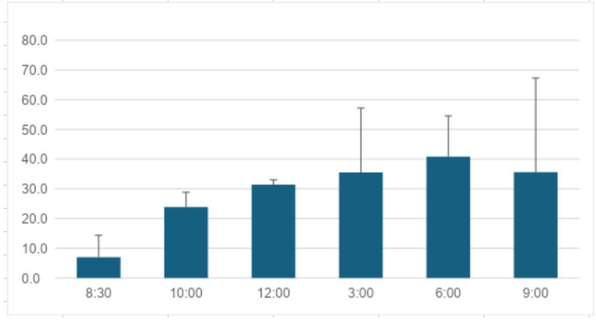

Figure 5. Exclude data that is above or below the deviation plus or minus the average.

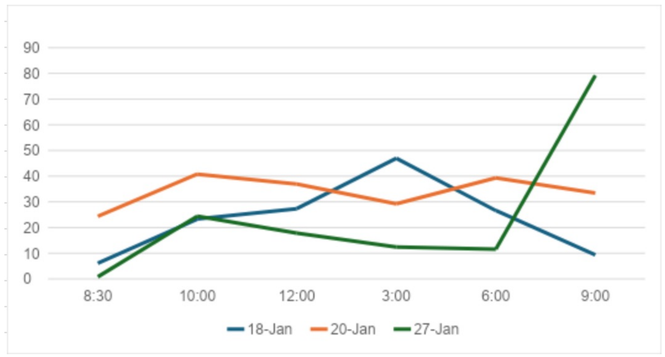

Figure 1. This graph shows the average Statherin levels of our samples for a subject across three different days throughout various times: 8:30am, 10:00am, 12:00pm, 3:00pm, 6:00pm, 9:00pm. On the first day, there was a peak in Statherin levels at 3:00 pm. Similar to the data in Figure 2., the Statherin levels spiked around 9:00pm.

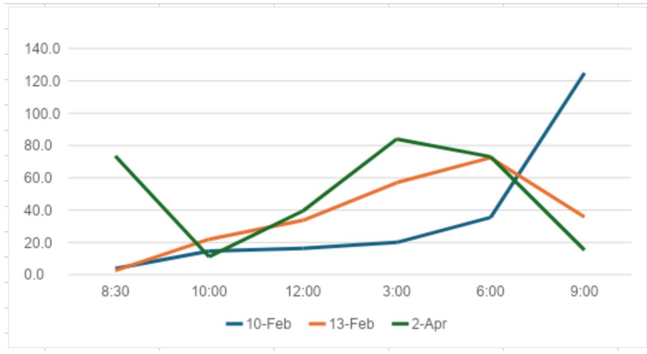

Figure 2. This graph shows the average Statherin levels for a subject of our samples across three different days throughout various times: 8:30am, 10:00am, 12:00pm, 3:00pm, 6:00pm, 9:00pm. The graph shows fluctuations for this patient which some peaks at 3:00pm and 6:00pm.

CONCLUSION

The results support the hypothesis that salivary statherin levels ossilate over the course of the day. Time of collection significantly affects observed concentration, reinforcing the need for time-standardized sampling protocols in future studies involving statherin. These changes must be accounted for when considering statherin as a diagnostic biomarker for oral health. Further investigation is needed to to determine factors influencing fluctuations in salivary statherin concentration.

ACKNOWLEDGEMENTS

We thank the University of the Pacific, School of Dentistry, and all study participants for their involvement. This study is conducted under IRB protocol #IRB2024-233

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INTRODUCTION

Can be bullet points or paragraph format. Give background information on statherin that is relevant to the data that will be presented. Be sure to mention that statherin concentration in saliva is being explored as a potential biomarker for various diseases such as diabetes. However, it is unclear if statherin levels are stable throughout the day.

OBJECTIVE

To determine the concentration of salivary statherin in unstimulated statherin during different times of the day.

HYPOTHESIS

Statherin concentration in unstimulated saliva will change throughout the day.

METHODS

This study was approved by the University of the Pacific IRB, protocol #IRB2024-233. Participants in the study were young, healthy male and female adults (ages 18–30) from the University of the Pacific Dental School. Saliva samples were collected at various times of the day. Samples were centrifuged to remove undissolved particles. Molecular analysis of statherin concentration was conducted using western blots. Total protein levels in the saliva samples were measured using a bicinchoninic acid assay. Participants also completed anonymized questionnaires covering demographics and general health.

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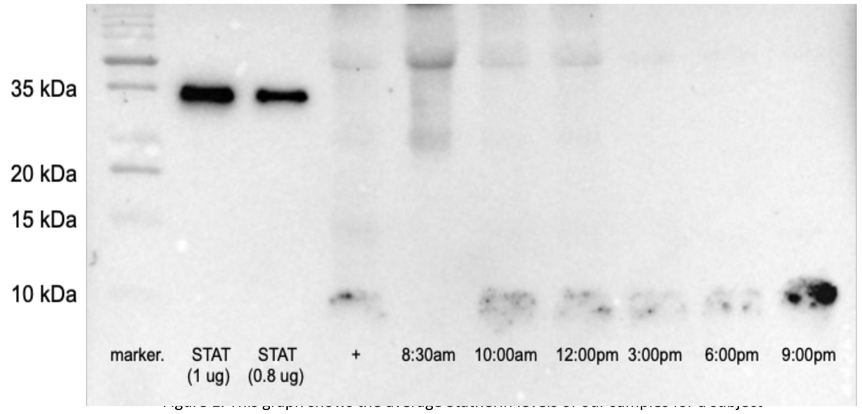

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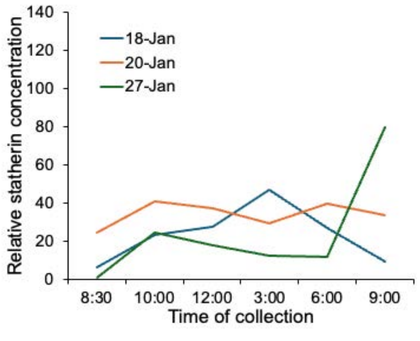

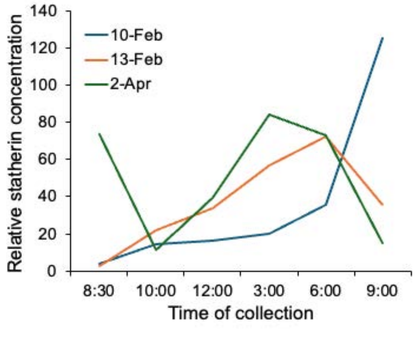

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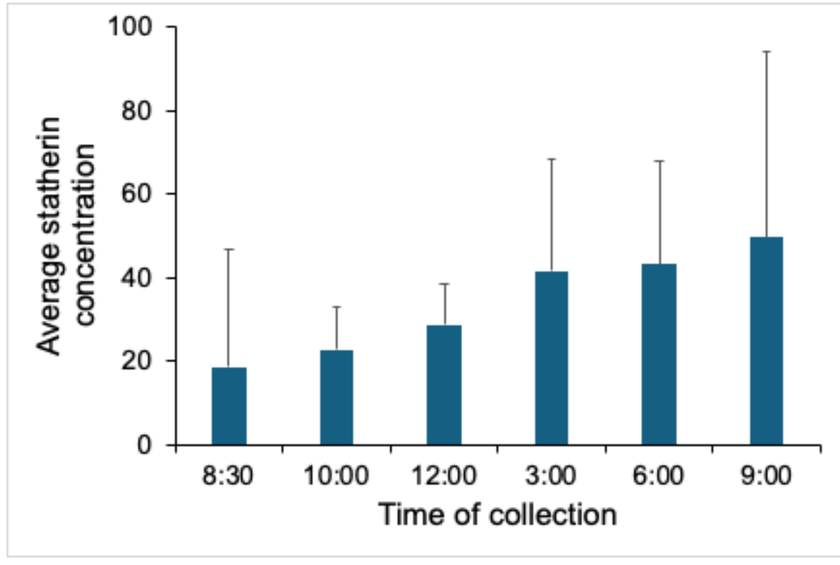

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CONCLUSION

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