

“Melatonin Levels in Periodontal Health & Disease”

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1. When was the work published?

This article was first published on August 21, 2012 by John Wiley & Sons Ltd.

2. What are the main points of the article?

The purpose of this study was to measure and interpret the relationship between melatonin levels in periodontal health and disease. Melatonin is a hormone secreted by the pineal gland that is released and dispensed into saliva through the bloodstream. The study consisted of melatonin measurements produced in GCF (gingival crevicular fluid) and saliva. The authors' hypothesis of this experiment predicted that there would be no significant difference between measurements of melatonin in each study group. The study consisted of four groups of 70 subjects in total that were evaluated by medical and dental history followed by a periodontal examination. In addition, the four groups were subdivided into; the control group: periodontal health, plaque-induced gingival inflammation, chronic periodontitis and aggressive periodontitis. To measure the level of melatonin, all groups were sampled for GCF and saliva. Results suggested that the highest concentration of melatonin levels were found in healthy patients. However, those with the least concentrated melatonin levels were found in aggressive periodontitis. The authors' hypothesis was partially incorrect. There was a significant difference of melatonin levels in health and disease, while a slight difference between aggressive and chronic periodontitis. This study may suggest that melatonin may act as a reducing oxidative agent with antioxidant properties allowing for tissue protection. Also indicated were the decreased levels of melatonin in disease that can be caused by the imbalance between pro-oxidant and antioxidant system which may possibly lead to tissue destruction. Hence, melatonin may be a factor to be used to differentiate between periodontitis and health.

3. Does the work meet the standards to be considered an appropriate/academic/scholarly source?

I believe this article partially meets the criteria of an appropriate source because it includes all sections of a research paper. The abstract is at the beginning of the article and although it consists of a short summary of all parts of the research, the information is subdivided into groups instead of being written as a complete short summary. The introduction includes the thesis of the conducted research with the authors' hypothesis. The methods and materials section provides all information needed except the duration of this experiment. In addition, this study was approved by "Ethics Committee of Riyadh College of Dentistry and Pharmacy". However, it fails to state if this study was "IRB" approved. As for the results, the article provides tables and numerical data to support the findings. For the discussion section, words such as "suggest" were used to indicate results. The conclusion section lacked the potential to restate the hypothesis and did not include a need for further studies because it was noted in the discussion section. The reference section meets the criteria of a scholarly journal by providing a list of cited sources.

4. Are the qualifications of the author(s) appropriate for an academic article? Briefly describe the author's qualifications.

All four authors are part of the department preventive dentistry and periodontics division therefore, they may have some qualities to write this journal due to their relation and knowledge on dentistry and periodontology. I was unsuccessful in finding any other background related sources on these authors. Therefore, not finding any information on neither author has made me question & feel suspicion to the actual qualifications of the authors on whether they are even qualified to write this journal.

5. Is the purpose clearly stated? Restate the purpose of the paper in your own words.

Yes, the purpose was clearly stated. The purpose of this study was to measure and interpret the relationship between melatonin levels in periodontal health and disease to suggest whether melatonin plays a role in gingival tissue health and/or disease.

6. Is the experimental design clearly described? Describe the design in your own words.

The experimental design is clearly described. It includes the conditions that are tested which are health and periodontitis. There is no treatment involved. Instead it includes saliva and GCF measurements to describe relations between melatonin and periodontitis. A research design of a retrospective non-experimental study was conducted using numerical values to interpret the findings and had a control group (those in health) versus those with a condition (periodontitis).

7. Have the possible influences on the findings been identified and controls instituted?

Describe and evaluate the use of controls and possible influences (spurious variables)

During the materials and methods section, it was implemented that all subjects that may influence the study were excluded from the study. This included smokers, pregnant women, uncontrolled systemic diseases, intellectual disabilities and subjects on medication that may interact with melatonin levels. Therefore, possible influences were removed from the study. The use of controls which was the periodontal health group was determined by the gingival index of Loe and Silness that indicates probing depths less than or equal to 3mm with no clinical attachment/bone loss.

8. Has the sample been appropriately selected (if applicable)? Describe the sample used in the study, and evaluate its appropriateness.

The sample size included 70 subjects that were thoroughly evaluated. All subjects were under

periodontal examination to distinguish what appropriate groups to be assigned to. Each group had 20 subjects while the control group (health) had only 10 subjects. I believe the control group should have also had 20 subjects to obtain equality within each group.

9. Has the reliability and validity of the article been assessed? Evaluate, and state the test/diagnosis results.

Yes, the validity of the article has been assessed because this study may be redone over time in the same way. Results suggested that the highest concentration of melatonin levels were found in healthy patients while the least concentrated was found in aggressive periodontitis. The authors' hypothesis was partially incorrect. There was a significant difference of melatonin levels within healthy and diseased subjects. Healthy subjects had a mean average of GCF - 16.6 and saliva - 22.9 and aggressive periodontitis had a mean average of GCF - 8.5 and saliva - 8.9. Furthermore, a slight difference was indicated in aggressive subjects with the average previously stated and chronic periodontitis with an average of GCF - 10.4 and saliva - 12.82.

10. Is the experimental therapy compared appropriately to the control therapy? Describe and evaluate the use of the control group.

Yes, the experimental therapy is appropriately compared to the control therapy because both groups were fairly compared. All subjects were selected for saliva collection and were instructed the same protocol. The melatonin levels for all subjects were measured the same way using immunoassay (ELISA DRG instrumentals GmbH, Marburg Germany). The use of the control group was to determine the relationship of melatonin levels between both health and disease.

11. Is the investigation of sufficient duration? Evaluate, and explain your reasoning.

The article does not indicate any length of time for the study but I believed that the study was

simply determined after the collection of saliva and GCF. Then melatonin levels were measured directly from those samples.

12. Have the research questions or hypothesis been answered? Restate the research questions and/or hypotheses in your own words, and describe if or how they are answered.

The authors' hypothesis of this experiment predicted that there would be no significant difference between measurements of melatonin in each study group. Results had suggested that the highest concentration of melatonin levels were found in healthy subjects while the least concentrated was found in aggressive periodontitis subjects. The authors' hypothesis was partially incorrect due to a significant difference in melatonin levels in health and disease while a slight difference between aggressive and chronic periodontitis.

13. Do the interpretations and conclusion logically follow the experimental finding? Restate the conclusion, and explain if or how they follow the experimental findings.

Yes, the interpretations and conclusion follow the experimental findings by suggesting that these melatonin levels may be related to the health or destruction of periodontal tissue. The conclusion indicates that the decreased melatonin levels in saliva and GCF were lowest in periodontitis subjects and may suggest that the absence of melatonin might have caused the destruction of tissue and increased inflammation.

14. Do you agree or disagree with the article and findings? Explain why?

I agree with this article. I feel that it was thoroughly conducted with accurate results. The health effects of melatonin have convinced me that it may be possible that melatonin can positively affect the periodontium and gingival tissues. Although I agree with this study, I do believe that

this study should be conducted again to provide more sufficient and accurate research on melatonin levels of periodontal health and diseased subjects.

15. What would you change in the article? Why? Think outside of the box. What would you add or delete?

In the article, I would change the sample selection. I would add 10 more healthy subjects to fairly have 20 subjects in each group. I would also find more female subjects since the predominant subject was male. I would also include the duration time of the experiment to make the experiment much clearer.