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College of Dentistry

The Adjunctive Use of Systemic Melatonin Therapy in the Treatment of Patients with Periodontitis Associated With Obesity (Clinical Trial)

A Thesis

Submitted to the council of the College of Dentistry at the University of Baghdad, in partial fulfillment of the requirements for the Degree of Master of Science in Periodontics

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Abstract

Background

Periodontitis and obesity are two common chronic inflammatory diseases leading to increased systemic inflammation.

It has been reported that obesity may be associated to periodontitis through the increased production of reactive oxygen species (ROS).To address this aspect, the adjunctive use of melatonin as antioxidant, anti-inflammatory, immunomodulatory medication reported to improve periodontal condition associated with obesity.

Aim of the study

To evaluate the effectiveness of adjunctive systemic administration of melatonin therapy to mechanical non- surgical periodontal therapy in periodontitis patients associated with obesity.

Subjects and methods

Eighty subjects were enrolled in the study and divided into:

Group I: 20 subjects with healthy periodontium and normal weight (control), the control group subjected for estimation of clinical periodontal parameters (plaque index, gingival index) biomarkers (receptor activator of nuclear kappa ligand, total antioxidant capacity and Melatonin) and lipid profiles (cholesterol, triglyceride ,high density lipoprotein, and low density lipoprotein) at the base line visit only.

Group II: 30 obese patients with insomnia suffering from periodontitis subjected to non-surgical periodontal treatment (scaling and root planing) only.

Group III: 30 obese patients with insomnia suffering from periodontitis subjected to non-surgical periodontal treatment (scaling and root planing supplemented with systemic administration of 5mg melatonin tablet for one month).

An obesity body mass index ≥30 kg was used according to Agamemnon *et al*. 2003 (Agamemnon and Stefan, 2003).

The latest two groups subjected for estimation of clinical periodontal parameters (Plaque index, gingival index, bleeding on probing, probing pocket depth, and relative attachment level), serum biomarkers and lipid profiles at the base line and after one month visits.

Results

Regarding the clinical parameters, at base line visit there were a highly significant difference between control and study groups ($p < 0.05$), the second visit exhibited decreasing in all parameters in both study groups except BOP score 0 were it increased with high significant differences and more effect size and variability in group III than those of group II when compared with base line visit. In base line visit, in group III the correlation between PLI /RANKL and between GI and melatonin were weak positive and negative significant correlation respectively. There were non-significant correlations between periodontal parameters and inflammatory markers in 2nd visit and in each group except BOP score 0 and score 1 with RANKL in group II the results showed weak negative and positive highly significant correlations respectively, in group III, the only weak negative significant correlation found between BOP score 1and TAO-C. There were no significant correlation between BMI and clinical periodontal parameters.

Regarding the biomarkers (RANKL,TAO-C and melatonin), similarly at base line visit there were highly significant differences between control and study groups ($p < 0.05$), at the base line visit showed significant decreasing in (TAO-C and Melatonin) with increasing in (RANKL) in both study groups when compared with control groups, the second visit showed increased in both (TAO-C and Melatonin) with decreasing in (RANKL) means in both study groups with highly significant difference and large effect size and variability for group III than those group II when compared with base line visit. There were only weak negative significant correlation between RANKL and TAO-C in base line visit in control group and negative weak significant correlation between RANKL and melatonin in group III in recall visit. There were highly significant strong negative correlation between BMI and melatonin in base line visit in group II. In post visit, between melatonin and BMI were weak positive significant correlation.

Regarding lipid profiles (chol, TG, HDL, LDL), at base line visit there were a highly significant difference between control and study groups ($p < 0.05$), the base line visit showed significant increase in all profile except HDL which showed decreasing in its level in both study groups. The second visit showed decreasing in all profile except HDL which increased in both study groups with highly significant difference and greater effect size with group III than those group II when compared with base line visit. All the correlation between lipid profile in base line and in recall visit in both study groups exhibited that there were strong positive high significant correlation between chol and TG, chol and LDL, LDL and TG in group II. In group III , all results showed strong positive significant correlation with only strong negative correlation between chol and HDL, HDL and LDL