

Nervousness; Pressure Ripostes in Patients During Conventional Dental Treatment and Long Duration Dental Procedures: An in Vivo Study

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ABSTRACT

Aim: The evaluation of patient behavior changes and stress/pressure assessment is important to treat dental patients. The present study was conducted to check salivary cortisol response to stress/pressure in patients during Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and long duration Dental procedures (Full Mouth Rehabilitation and Orthodontic Treatment)

Materials and Method: The salivary cortisol level were evaluated in 40 patients, out of which 10 patients were physically fit patient who do not require any dental treatment and 30 patients who underwent one of the Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and thereafter undergone long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment). The groups divided were as follows.

Group 1: control group with no treatment and just the saliva sample was taken.

Group 2; The patients underwent Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction)

Group 3; The patients underwent long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment)

The salivary cortisol levels were evaluated using Salivary Cortisol Enzyme Immunoassay Kit.

Results: The salivary cortisol level was highest in the patients who underwent Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and lowest in physically fit patients. There was no significant difference in salivary cortisol level in control group with no treatment and in the patients who underwent long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment).

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Conclusion: The stress/pressure level was highest in the patients who underwent Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and lowest in physically fit patients.

Keywords: Nervousness, Pressure, Cortisol level, Fear.

INTRODUCTION

The behavior changes need to be addressed for treating dental patients. The stress/pressure ripostes are not invariably hostile. ¹ Psychological stress/pressure are the most common and frequent clinical disorders in the general populations and are also significantly present among students pertaining to academics, social and peer pressure. ² The stress/pressure disturbances are the common mental disorder. ³ **Hannibal KE, Bishop MD**⁴ reported extended stress/pressure reaction may develop cortisol dysfunction and severe pain. It may result in change in behavior in children and affects the dental procedures. By downgrading stress/pressure of dental procedures will elevate the adjustability of patients and help them to easily get their dental procedures done. ^{5,6,7} Saliva can be used as a sample for stress/pressure-related substance measurement because its collection is not invasive and not harmful, and can be collected with little efforts than blood sampling. Stress/pressure-connected substances incorporated in saliva include chromogranin A (CgA), secretory immunoglobulin A (sIgA), and salivary amylase, catecholamine and cortisol^{8,9}.

There is marked contrast in patients' reaction to stress/pressure in children who are involved not only in a anguish procedure but also a painfree treatment. The anxious tense feeling while in the Dental chair and the procedure itself can develop nervousness. The outcome with application of anesthesia and with anguish procedures are unavoidable. Dental scenario can be origin of stress/pressure for young patients. The stress/pressure state may develop anxiety and worry in patients. ¹⁰ Therefore the evaluation of behavior changes is required in patients undergoing dental treatment and this stress/pressure vary in the consecutive visits that pursue to rely upon to what they are open to, during these visits.

There is connection between stress/pressure and pain but the pain rehabilitation

is not dissertated. Therefore the present study was conducted to check salivary cortisol response to stress/pressure in patients during Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and long duration Dental procedure (Full Mouth Rehabilitation and Orthodontic Treatment)

AIMS AND OBJECTIVES

1. To check salivary cortisol level in physically fit patient.
2. To check salivary cortisol level in patient who underwent either one of the Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction)
3. To check salivary cortisol level in patient who underwent long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment)
4. To comparatively evaluate salivary cortisol level in patients undergoing either one of the Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and thereafter long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment)

MATERIAL AND METHODOLOGY

There was 40 participant (20 control and 20 patients) who participated in the present study. All concerned participant were being asked to give relevant medical and dental history. 40 patients age group ranging 25-35 were included in the study. Those patients who compulsorily required either full mouth rehabilitation or orthodontic treatment for correction of malalignment of teeth were chosen for the present study. The investigation motive was prior informed to patients requesting them for accumulation of saliva sample. These patients underwent either one of the Conventional Dental

Table 1: Comparative mean salivary cortisol level(ng/ml) for group 1,group 2 and group 3.

		Cortisol Level (ng/ml)			
Groups	Number	Mean	S.D.	F-value	p-value
Group 1 Control Group	20	12.40	2.13	10.180	< 0.001* ^a
Group 2 Conventional Dental Treatment	20	15.84	3.29		
Group 3 Delayed Dental Treatment	20	13.12	2.01		
Group 1 vs Group 2 ^b					0.001*
Group 1 vs Group 3 ^b					< 0.645
Group 2 vs Group 3 ^b					0.004*

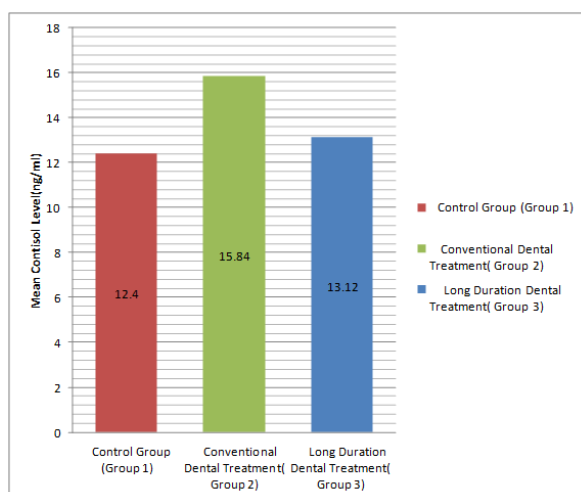


Fig 1: Comparative mean salivary cortisol level(ng/ml) for group 1, group 2, and group 3.

treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and thereafter undergone long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment). They were divided into 3 groups

Group 1: control group with no treatment and just the saliva sample was taken.

Group 2; The patients underwent one of the Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple

Extraction). The treatment completed within 4 appointments.(3-5 days)

Group 3; The patients underwent long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment) full mouth rehabilitation was completed in 3 months and orthodontic treatment was continued till 1 year

The saliva was collected 5 minutes before patients sat on dental chair for group 1 subjects, however for group 2,group 3 subjects saliva was gathered 10 minutes after commencement of dental procedures. All the participants were informed to accumulate saliva samples in polypropylene vials and stocked in freezer. Around 1.0 ml of non-reviving saliva was assembled in a sterile tube and frozen latter at 20 degree centigrade for further investigation. The salivary cortisol levels were checked using Salivary Cortisol Enzyme Immunoassay Kit (Salimetric™, LLC State college PA, USA)

Statistical Analysis:

The statistical analysis were done using One-way ANOVA test and Post-hoc Tuckey test

Level of Significance (p-value)

❖ P-value < 0.05 - Significant

RESULTS

The mean cortisol level (ng/ml) was compared between control group, and among the different study groups using the one way ANOVA test with post-hoc Tuckey test for inter group comparison. There was a significant difference in mean cortisol level between the control group, group 2 (Conventional Dental treatment) and group 3 (Long duration Dental treatment). (Table 1 and Graph 1). The mean cortisol level was significantly more among group 2 (Conventional Dental treatment) in comparison to groups 1 (control group). (Table 1 and Graph 1)

There was no significant difference in mean cortisol level in control group with no treatment and in the group 3 (Long duration Dental treatment group). The mean cortisol level was significantly more among groups 2 (Conventional Dental treatment) in comparison to group 3. (Long duration Dental treatment group) (Table 1 and Graph 1)

DISCUSSION

The cortisol maintains and recalls the frightening participation of dental treatment. There is endurance of powerful touching recall happening in fear and post traumatic pressure thrown into the state of disorganization ¹¹. Lai JCL ¹² reported that the adaptation in stress/pressure hormone, cortisol to critical psychosocial pressure is not always a result of aging. Severe pressure and raised cortisol level increases the possibility for depression, mental disorder, anxiety, and lesser life hopefulness. The cortisol is delivered in reaction to anxiety, pressure or stress/pressure by adrenal gland. The cortisol can also be emancipated in situations like getting up early morning, exertion and acute pressure or tension. The cortisone enables the body for attack or flying reaction by immersing it with glucose, providing an instant energy origin to large muscles. The cortisol hinder insulin release in an aim to stop glucose from being stocked approving instant release ¹³. The present study was conducted to check salivary cortisol response to stress/pressure in patients during Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and long duration Dental procedure (Full Mouth Rehabilitation and Orthodontic Treatment)

There was significant difference in cortisol level in control group compared to group 2 subjects. The salivary cortisol level was highest in the patients who underwent one of the Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and lowest in physically fit patients. Group 2 opened to dental treatment develops an elevation of salivary cortisol level in contrast to control group with no treatment wherein just the saliva sample was taken. Dental treatment raises tension and uneasiness level which further elevates salivary cortisol. There was no significant difference in salivary cortisol level in control group with no treatment and in the patients who underwent long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment). Group 3 patients who either underwent one of the long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment) have become familiar with the Dentist so their stress/pressure or cortisol level did not raised significantly as compared to control group with no treatment wherein just the saliva sample was taken. The mean cortisol level was significantly more among groups 2 (Conventional Dental treatment) in comparison to group 3. (Long duration Dental treatment group). In group 2 patients opened to conventional dental treatment the cortisol level raised and as the cortisol is delivered in reaction to anxiety, pressure /stress is developed during treatment but in group 3 subjects as the patients have become familiar with the dentist so the cortisol delivered was less.

CONCLUSION

The salivary cortisol level was highest in the patients who underwent Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable partial Dentures and Simple Extraction) and lowest in physically fit patients. There was no significant difference in salivary cortisol level in control group with no treatment and in the patients who underwent long duration Dental procedure (Full Mouth Rehabilitation or Orthodontic Treatment). The stress/pressure level was highest in the patients who underwent Conventional Dental treatment (Scaling, Restoration, Root Canal Treatment, Impression making for Removable

partial Dentures and Simple Extraction) and lowest in physically fit.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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