

A Novel Homemade Appliance For Noise Reduction From Chair Side Dental Compressor

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Abstract

Background: This study was conducted to compare and measure the level of sound emitted from a standard dental compressor at three different positions in a standardized dental setup with and without a novel home-made enclosure.

Material and methods: To make a standardized clinical set up, an isolated glass encased room was used. Position of decibelometer was fixed at 11'o clock analogous to position of right handed operator. Chairside dental compressor (Confident Dental Equipment) was turned on for 30 minutes and the noise registered on decibelometer first without any enclosure and secondly with enclosure (Made Of Jute Fibre) at three different positions. To check any temperature raised with use of enclosure, a digital thermometer was attached to the compressor.

Results: Significant reduction in noise was perceived at all positions with and without enclosure. A difference of 10-16 decibel of reduction was recorded at all positions. No significant temperature rise of compressor was observed with and without enclosure.

Conclusion: This study concluded the use of home made jute fiber significantly reduce the noise produced by standard dental compressor. However further research in the subject is warranted.

Introduction

Noise is a sound that is loud or unpleasant or that causes disturbance.¹ Learning-teaching activities at a dental school require the use of diverse equipments that emit noise. Prolonged exposure to noise can lead to noise induced hearing loss cause 28% hearing loss.² According to Osha, just 8 hours of continual exposure to noise level of 85 decibels is permissible daily.³

Ideally one dental chair will require 10 feet by 7 feet space inside operatory room with 9 feet height. According to NDC BILL 2020, only 3% of Indian dentists deliver dental care through government facilities, most of them work out in private clinics.

Material and methods

To make a standardized clinical set up, an isolated glass encased room was used. Position of decibelometer was fixed at 11'o clock analogous to position of right handed operator. Chairside dental compressor (Confident Dental Equipment) was turned on for 30 minutes and the noise registered on decibelometer first without any enclosure and secondly with enclosure (Made Of Jute Fibre) at three different positions. To check any temperature raised with use of enclosure, a digital thermometer was attached to the compressor.

Groups:

Group 1: Compressor Placed At 1'o Clock Position

Group 2: Compressor Placed At 3'o Clock Position

Group 3: Compressor Placed At 5'o Clock Position

Results

Significant reduction in noise was perceived at all positions with and without enclosure. A difference of 10-16 decibel of reduction was recorded at all positions. No significant temperature rise of compressor was observed with and without enclosure.

Discussion

Noise can hamper communication, produce stress, induce annoyance and cause a hearing loss in the affected individual, which can affect the dentist and his patient. The equipment that was used to measure the sound level in this study measured the sound pressure level (In Db) by employing a network of filters that represent the frequency response of the ear.⁴ Most of dental clinic has three spot where they can be used. In different clinics, position is variable that is why we have chosen three positions. It simulates clinical scenario of standardized Indian setup. In this study, changing the position of compressor (1'o Clock, 3'o Clock, 5'o Clock) had a

maximum reduction of 9db, which can be increased after enclosing the compressor with home-made appliance. In our study, we also measure the temperature raise of the compressor after enclosing and concluded the temperature difference with and without enclosing is not significant. This can be attributed to the fact the jute fiber that has been used in this study has the ignition temperature of 193 degree C and also the material is porous in nature which allow air to pass through.⁵ In this study, significant reduction in noise was perceived at all positions with and without enclosure. A difference of 10-16 decibel of reduction was recorded at all positions. No significant temperature rise of compressor was observed with and without enclosure.

Conclusion

This study concluded the use of home made jute fiber significantly reduce the noise produced by standard dental compressor. However further research in the subject is warranted.

References

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