

EFFECT OF SODIUM BICARBONATE BUFFERED ARTICANE IN ACCELERATING THE ONSET OF ANAESTHESIA IN CHILDREN: A RANDOMISED CONTROLLED CLINICAL TRIAL

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INTRODUCTION

Duration of the dental treatment is a very important factor for the success of the dental work especially in children, thus the demand for a less painful, faster onset and effective potency of anaesthetic solution is a great concern for pediatric dentists to maintain the cooperation of the children on dental chair. Buffered anaesthetic solutions create pH after injection nearly close to that of the normal tissue pH resulting in more rapid drug diffusion and a quicker onset of the nerve blocking as well as less painful experience during injection.

Aim of the study to evaluate the effectiveness of adding 8.4% Sodium Bicarbonate to 4% Articaine with ratio 1:19 in accelerating the onset time of the anaesthesia compared to using conventional unbuffered local anaesthesia.

METHODOLOGY

This study is a triple blinded randomized controlled clinical trial, cross-over design, that included 27 children, aged 5-7 with at least one lower molar in both sides indicated for pulpotomy. They were randomly allocated to two groups; (Test and control groups) according to the local anaesthetic solution where each patient randomly received buffered anaesthetic solution (BAS) in one side Figure (1) (Test group) and unbuffered anaesthetic solution (UBAS) on the other side (Control group). The onset time of the anaesthesia was recorded using Transcutaneous Electric Nerve Stimulator (TENS) on the lips of the child, where the lowest intensity at which the patient first reported feeling the stimulus was recorded before the administration of the anaesthesia then immediately after the injection the intensity was recorded every 30 seconds starting by the lowest intensity which was measured and increased gradually, until full lip numbness is declared Figure (2).

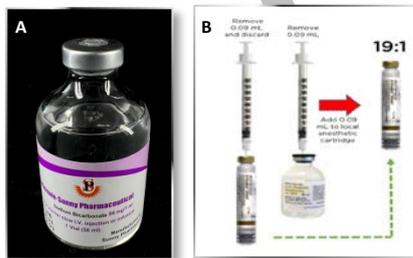


Figure (1): (A) 8.4% sodium bicarbonate vial (B) Remove and replace buffering method in ratio 19:1



Figure (2): (A) TENS Device. (B) Trial of TENS device on lips of patient

RESULTS AND DISCUSSION

A total of 27 children (16 males and 11 females) with mean age 6.5 participated in the study. The onset time showed a significant faster time in the BAS group ($p < 0.001$), where the mean (SD) of BAS was 99.55(23.40) seconds while that of the UBAS was 137.33(23.89) seconds. The mean difference and SD between the two groups was 38.18(34.87) seconds. Figure (3)

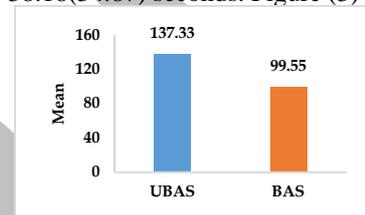


Figure (3): Comparison between the Onset time in the two study groups

CONCLUSIONS

Buffered Anaesthetic solutions are more effective in accelerating the onset time of the anaesthesia compared to the unbuffered conventional solutions. This could be particularly useful in body sites with low tissue buffering capacity where there can be a delay in the rise of pH after injection.

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