Effect of Moringa Oleifeira and Egg shell on Remineralization of Artificially Demineralized Enamel in primary teeth
"Protocol"

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Method Article

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Abstract

The present in vitro study aimed to compare the effect of Moringa Oleifera and egg shell on artificially demineralized enamel in primary teeth

Introduction

The early enamel carious lesion often referred as white spots results when the pH level at the tooth surface is lowered by the production of acids by cariogenic bacteria. The acid ions penetrate deeply into the prism sheath porosities leading to subsurface lesions leaving the surface intact because of the fact that remineralization occur preferentially at the surface due to increased levels of Ca and HPO4 ions, fluoride ions, and buffering by salivary products.

The recent dental practices shift toward noninvasive conservative techniques. The Moringa oleifera and egg shell is improved that have minerals that can provide Remineralization of Remineralised defects. This paper aiming to observe the effect of Moringa oleifera and egg shell on primary extracted teeth.

2. Teeth selection: forty primary teeth extracted for orthodontic purpose will be cleaned, washed with deionized water. Any tooth with crack or enamel defect will be excluded, after that they will be kept in a plastic screwed container filled with sterile saline and Samples will be stored at room temperature until use. (1)

3. Materials and methods:

3.1 Specimen preparation:

Radicular part of each tooth will be removed, and the coronal part will then longitudinally be sectioned in the mesio-distal direction into two sections resulting into 60 specimens using a high-speed diamond tipped disc under water coolant. The specimens will then randomly be divided equally into four groups to prepare enamel specimens. Samples will be cut at level of enamel to expose fresh layer of enamel (6 X 4 X 4m3) using a diamond tipped disc under high speed and water coolant.

3.2. Demineralization of samples:

The samples will be inserted into tubes containing 20ml of demineralizing solution at room temperature for 48 hours for enamel samples to create lesions. The demineralized solution will be refreshed daily and not stirred during the demineralization period. Subsequently, the samples will be rinsed thoroughly with deionized water to eliminate the demineralized gel from the sample surface. (2)
3.3. Moringa oleifera preparation:

Lyophilized MOL extract will be prepared in the national research center, Cairo, Egypt. Leaves were collected, washed, dried and grinded.

Extract from the dried powder will be prepared through extraction with 80% ethyl alcohol. The combined ethanolic extract will then be evaporated till dryness at 45°C using rotary evaporator under reduced pressure. The obtained mark will be dissolved in water, frozen and lyophilized to obtain lyophilized dry powder.(3)

3.4. Egg shell solution preparation:

Chicken egg will be washed and left in boiled water for ten minutes to assist in membranes removal. The eggshells were then grinded into small particles with sterile mortar and pestle. The small particles gained were kept in an ofen (Combilabor apan) at 1000°C for 90 minutes to be sure that the obtained powder is free of pathogen. The CESP solution was prepared by dissolving a gram of CESP in 20 ml of deionized water.

3.5. Scanning electron microscope/energy dispersive x-ray examination (SEM/EDX):

The enamel surfaces of samples from each group will be scanned by SEM attached with EDX Unit (Quanta 250 FEG microscope, Netherlands) at an acceleration voltage of 30 kv. Representative microphotographs will be captured, and elemental analysis of each surface will be done.

3.6 Microhardness assessment:

Vicker’s micro hardness tester (Wilson Tukon 11102 micro hardness tester Buehler Germany) at load of 100 gm. will be used. The load will be applied smooth for 10 seconds and after load removing, two impression diagonals will be measured, usually to the nearest 0.1 μm with a filar micrometer, and will be averaged. The Vickers hardness (HV) will be calculated using: \( MHV = \frac{1854.4L}{d^2} \) (Where the load \( L \) is in gf and the average diagonal \( d \) is in μm.) The examiner took three indentations Vickers hardness number at spacing of 100 microns and the mean value will be calculated.
Equipment

Procedure

Forty intact primary molar teeth were sectioned mesiodistally. The demineralized samples of enamel were randomly divided into 2 subgroups according to the treatment utilized. Group 1: Moringa Oleifera extract, Group 2: Egg shell, Group 3: Fluoride varnish (+ve control), Group 4: Artificial saliva (-ve control).

The samples were subsequently evaluated using Vicker's microhardness tester. Data were tabulated and statistically analyzed using ANOVA and t-test.

References

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