

## Original Research Article

### 0.2% Chlorhexidine: An effective oral care against Alpha Haemolytic *Streptococci*

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#### ABSTRACT

The oral cavity works in a state of equilibrium, functioning to aid in digestion, respiration and communication and aim to protect the body from exogenous sources. The oropharynx of a healthy person is colonized by greater than 250 different microorganisms with the majority of microorganism living in symbiosis with the host and the referred to as commensal flora. Quasi experimental design was adopted and total 60 self care deficit clients were involved from medical surgical wards and intensive care unit by purposive sampling technique. Experimental group (n=30) received oral care with 0.2% chlorhexidine and Control group (n=30) received oral care with normal saline. Two Gingival samples were collected and inoculated on blood agar medium to identify the alpha Hemolytic streptococci. In both groups alpha Hemolytic streptococci had confluent growth before the intervention. But after the intervention Experimental group had moderate growth level of alpha Hemolytic streptococci but control group had confluent growth level of alpha Hemolytic streptococci. Therefore, it can be concluded that 0.2% chlorhexidine is effective in controlling the alpha Hemolytic streptococci in self care deficit clients than the normal saline.

#### Keywords

Self Care  
Deficit clients,  
0.2%  
chlorhexidine  
and alpha  
Hemolytic  
streptococci

## Introduction

Oral infections are very common. Bacteria and viruses usually cause oral infection. They can affect all the parts of oral cavity. Simple oral infections are limited to the mouth and are different from oral lesions which is non infectious. Many oral infections are not contagious because bacteria that exist naturally in every person's mouth. However Herpangia and recurrent Herpes Labialis are highly contagious.<sup>1</sup>

The oral cavity has long been considered a

potential reservoir for respiratory pathogens. Critically ill patients are undernourished, dehydrated, immunosuppressed and thus are at great risk for poor oral health. The mechanism of infection could be aspiration into the lung of oral pathogens capable of causing pneumonia. Several anaerobic bacteria from the periodontal pocket have been isolated from infected lungs.<sup>2</sup>

Normal saline is a sterile, nonpyrogenic solution for fluid and electrolyte

replenishment. It is an isotonic crystalloid with pH of 5.0 (4.5 to 7.0) and it replaces water and electrolyte. Normal saline is not damaging to the oral mucosa and an isotonic solution (0.9%) is recommended for oral care.<sup>3</sup>

Chlorhexidine, to date is the most potent anti plaque agent. It is considered gold standard anti plaque agent, against which efficacy of other anti plaque and anti-gingivitis agents is measured. Its efficacy can be attributed to its bacteriostatic and bactericidal properties and its substantivity within the oral cavity. The antimicrobial properties of Chlorhexidine are attributed to its bicationic molecule, and this same property is the basis of its most common side effect, extrinsic tooth staining.<sup>4</sup>

### **Materials and Methods**

Total 60 self care deficit clients were selected by purposive sampling method and assigned as control and experimental group. On first day, gingival swab samples were collected and inoculated on blood agar medium to identify alpha Hemolytic streptococci. On first day and second day, experimental group received oral care with 0.2% chlorhexidine and Control group received oral care with normal saline. Oral care included cleansing of inner tooth surface, outer tooth surface, roof, gums, inside cheeks and tongue using sterile gauze swab for 1-2 min, 2 times daily for 2 days.

On 3<sup>rd</sup> day, gingival swab samples were collected to assess the effectiveness of 0.2% chlorhexidine and normal saline in terms of colony count of Alpha Hemolytic streptococci. Colony count of alpha hemolytic streptococci was done using colony counter and ascertained by microbiologist. It was categorized under three groups i.e. Scanty growth (< 20 CFU/cm<sup>3</sup>), Moderate growth (20 - 100CFU/

cm<sup>3</sup>) and Confluent growth (> 100CFU/cm<sup>3</sup>).

### **Result and Discussion**

Total 60 patients were included in this study, among them 19(63%) males and 11(37%) females in experimental group and 20(67%) males and 10 (33%) females in control group (Figure 1). Most of the patients (70% in experimental & 80 % in control group) were from age group of more than 40 years (Table 1).

Most of the self care deficit clients had confluent growth of alpha Hemolytic streptococci in experimental (n=29) and control group (n=29) before administration of oral care respectively. Both groups were homogenous in terms of Age, Gender, use of antihypertensive drugs, corticosteroids, antibiotics, diuretics and level of consciousness (p>0.05 level).

After oral care with 0.2% chlorhexidine for two consecutive days, colony count of alpha Haemolytic bacteria were plummeted to a level of moderate growth whereas in case of control group, Colony count of alpha haemolytic bacteria remained same (Table 2).

Saline mouthwashes are widely advocated in the nursing literature. Normal saline is not damaging to the oral mucosa (Madeya, 1996)<sup>5</sup> and an isotonic solution (0.9% /v) is recommended for mouth care by Thurgood (1994)<sup>6</sup>. Although, there was not enough research information available to provide evidence of the effects of mouth care rinses normal saline, but because of its tendency to cause drying, its routine use as a mouthwash is limited in the critical care setting (Berry and Davidson, 2006)<sup>7</sup>. There is some evidence that the use of physiological salt solution can promote healing of oral mucosal lesions.

Walsh (2000) suggests sodium bicarbonate can be used to increase salivary pH and buffer capacity, suppress the overgrowth of micro-organisms, improve or normalise taste and neutralize acids and prevent erosion<sup>8</sup>.

This findings were supported by Santos S et al, the 0.2% chlorohexidine was found to be effective in significantly reducing the bacteria in the oral flora compared with placebo<sup>9</sup>. Another study was done by Jatinder Somal et al, reported that gingival and dental plaque antiseptic decontamination with 0.2 % chlorohexidine significantly decreased the oropharyngeal colonization by aerobic pathogens in ventilated patients<sup>10</sup>.

A randomized, double-blind, controlled clinical trial—examined whether risk of VAP in ICU patients is reduced by oral swabbing with 0.2% CHX 4 times a day,

compared to saline (control group). Based on results from 61 patients, the VAP development rate was significantly higher in the control group than in the CHX group (68.8% versus 41.4%, respectively)<sup>11</sup>.

Koeman et al used a 2.0% solution of CHX that did not reduce the incidence of nosocomial infection compared to that seen in control groups. But most of the other studies used much less concentrated solutions of 0.12% or 0.2%.<sup>12</sup>

The findings of this study revealed that, 0.2% Chlorohexidine was effective in decreasing the alpha hemolytic streptococci than oral routine by normal saline among self care deficit clients. Hence, it is recommended to use 0.2% chlorhexidine to minimize alpha hemolytic streptococci growth.

**Table.1** Frequency distribution of sample characteristics N=60

Sample Characteristics	Experimental Group (n=30) f (%)	Control Group (n=30) f (%)
<b>1. Age in years</b>		
1.1 . 18- 40	9 (30%)	(20%)
1.2. > 40	21 (70%)	24 (80%)

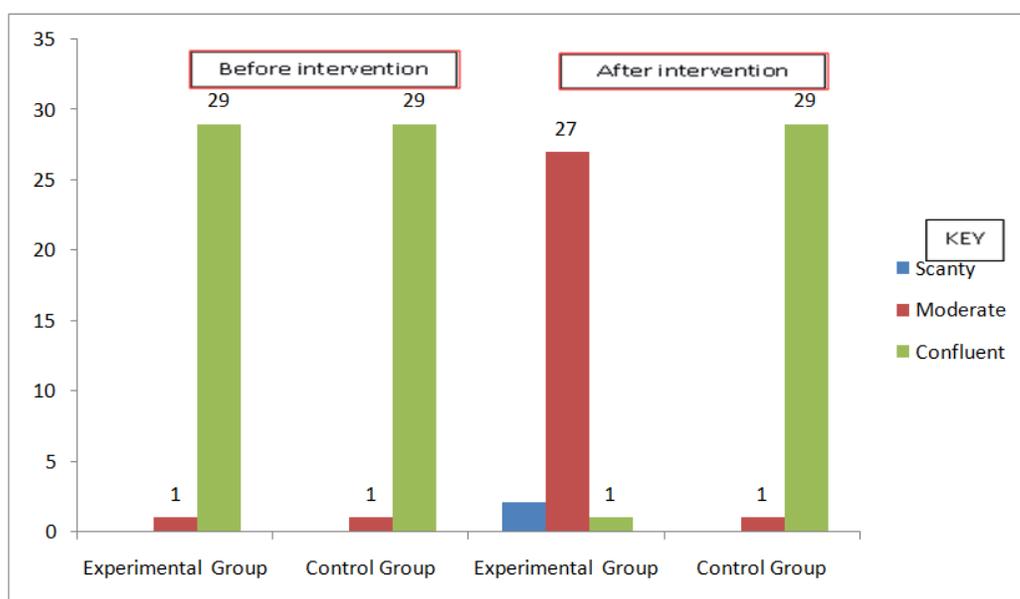
**Table.2** Comparison of experimental and control group in terms of level of microbiological colony count of self care deficit clients before and after administrating oral car N=60

Group	Before			After		
	Scanty	Moderate growth	confluent	Scanty	Moderate growth	Confluent
Experimental (n=30)	0	1	29	02	27	1
Control (n=30)	0	1	29	0	1	29

**Fig.1** Pie diagram showing Sex wise distribution of samples in Experimental & Control Group



**Fig.2** Bar diagram showing comparison of level of microbiological colony count in experimental and control group before and after oral care



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