

Influences of Milk of Magnesia and Chewing Gum on Oral Conditions of Patients

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국문 초록

무의식환자와 수술후환자의 구강청결방법으로 Milk of Magnesia를 사용하였을 때의 효과여부와 수술환자에게 Milk of Magnesia와 함께 Chewing Gum을 사용했을 때의 효과여부를 측정하기 위하여 인디애나대학 Medical Center에 입원한 무의식환자 2명과 수술후 마취에서 깨어난 환자 4명을 대상으로 하여 7-8시간 간격으로 2일간 구강청결을 실시했다. 본 연구는 1969년 가을학기에 시행했으며 분석방법으로는 표본 크기가 적은 경우에도 사용할 수 있는 방법의 T-test를 사용했으며 그 결과는 다음과 같다.

1. 무의식환자에서 Milk of Magnesia로 구강청결을 시행했을 때의 구강상태는 시행전보다 유의적으로 호전되지 못했다($p > 0.1$).
2. 수술후환자에서 Milk of Magnesia로 구강청결을 시행했을 때의 구강상태는 시행전보다 유의적으로 호전되었다($p > 0.05$).
3. 수술후환자에서 Milk of Magnesia와 Chewing Gum을 동반하여 사용했을 때의 구강상태는 유의적으로 호전되었다($p < 0.05$).

Introduction

The purpose of mouth care is to maintain good oral hygiene and to prevent complications, such as herpes parotitis, aspiration, and respiratory infection. In all patients with various diseases the nurse is responsible not only for providing for the oral hygiene of the patient, but also for the selection of more effective agents and techniques, and for critical evaluation of the

ursing treatment.

In the normal person, salivary glands play an important role in keeping the mouth clean. Since the glands pour out about two and a half pints of saliva a day, food debris, worn-out cells and foreign particles are washed off the surfaces of the mouth and teeth, and are then swallowed, if routine tooth brushing is combined with the normal physiological function.

During a serious illness or unconsciousness, the patient, however, may lose all interest in

food, so that the salivary glands do not receive their normal stimulation, and they therefore produce much less saliva. The unconscious patient may lie with his mouth open so that moisture in the mouth evaporates. If nothing is taken by mouth there results a lack of salivation due to lack of stimulation. If little fluid is taken into the body, then less is excreted by all its glands, so the amount of saliva is further reduced. If the body temperature is high, the mouth becomes dry,

In order to provide for better oral hygiene for the patient, this small clinical study was attempted during the first semester of 1969.

Review of Related Literature

In relation to the effective mouth care of patients who are unconscious or who are given nothing by mouth following surgery, there are a few research studies.

Passon and Brand¹, in their study of effects of agents used for oral hygiene, found that improvement of oral conditions occurred more frequently among patients in groups using Hydrogen Peroxide (half strength) or Milk of Magnesia substrate, when the oral hygiene of three groups of 22 patients each was provided for by using three different oral hygiene agents for each group—Milk of Magnesia substrate, Alkaline Aromatic Mouth wash, or Hydrogen Peroxide. Passon and Brand mentioned that Milk of Magnesia, as an alkaline substance, reduces oral acidity, dissolves mucin films, and, as an insoluble antacid, has longer duration of action than the soluble compounds. Also, it is considered to be especially beneficial to the patient who is a mouth-breather, or to one who has thick saliva, since it is a chemical stimulant effecting the flow of the thin serous secretion.

Dobbs² mentioned that Milk of Magnesia acts chemically upon the contents of the cells, and the oral receptors respond to the stimulus by increasing the flow of saliva, which in turn

buffers the effects of the medication.

Hubbard Martha³, one of my classmates in the graduate program of nursing, recommended the Milk of Magnesia substrate, because she experienced that the agent is effective for oral hygiene.

Markham⁴ mentioned that movement of the cheek muscles and the tongue in the process of mastication helps considerably to clean the mouth and that chewing gum may be used for this purpose.

Hypotheses and Treatment System

Null hypotheses of this study are as follows:

1. There will be no difference between oral conditions prior to and after mouth care with the Milk of Magnesia substrate in the unconscious mouth-breathers.
2. There will be no difference between oral conditions prior to and after mouth care with the Milk of Magnesia substrate in the postoperative patients.
3. There will be no difference between oral conditions prior to and after mouth care with the Milk of Magnesia substrate in the postoperative patients, when chewing gum is used in addition to mouth care.

Two unconscious mouth-breathers and four postoperative patients who had just recovered from general anesthesia were selected as sample groups among patients at Long Hospital, Indiana University Medical Center.

Individuals with normal body temperature and with a well-balanced amount of intake and output were selected. Normal body temperature means an oral temperature between 36 and 37.4 degree of Centigrade⁵. Well-balanced amount of intake means daily fluid intake above 1,500ml.; and wellbalanced amount of output means 24-hour urine amount above 500 ml. and additional output if there is any⁶. In all cases nothing was taken by mouth and nutrition was supplied by parent-

eral fluid or by nasogastric tube or gastrostomy tube feeding. None of the individuals except the unconscious patients was a mouth-breather.

When the Milk of Magnesia solution containing approximately 8 percent of the base had settled for 48 hours, a stratum of water separated out on the top of the container. Only the settled part of the Milk of Magnesia was used as an oral hygiene agent.

Mouth care with the Milk of Magnesia substrate was given to the two unconscious mouth-breathers every 7 or 8 hours for two days. The same agent was used every 7 or 8 hours for two days for two of the conscious patients who had recovered from general anesthesia. The rest of the postoperative patients in the same condition chewed gum for more than 10 minutes at a time between each mouth care session, in addition to using the same agent at the same intervals. Three or four c.c. of the Milk of Magnesia substrate were applied to the inside of the mouth, left for 15 to 20 minutes so as to react chemically with the cells, and then mechanically cleansed with water or with pieces of wet gauze.

Analysis and Interpretation of Data

The states of salivation, tongue, palate, gum and mucous membrane, teeth, and the degree of foul breath were, as shown in Table 1, scored as 1, 2, and 3 from the normal or slightly poor condition to the moderately poor condition, and to the very severe condition.

Since the sample sizes are small, that is, less than 30 cases, standard error of the difference (T-test) was used by pooling the data from two samples.

<TABLE 1> Possible Conditions of the Mouth and Their Rating Scale

Location and Condition	Score
Saliva	
Moist & moderate amount of saliva	1
Moist & scanty saliva	2
Viscid & scanty saliva	3
Tongue	
Wet and slightly or not coated tongue	1

Dry and moderately coated tongue	2
Dry and abundantly coated tongue	3
Palate	
Wet and absent or small amount of debris	1
Dry and moderate amount of debris	2
Dry and large amount of debris	3
Gum and Mucous Membrane	
Wet and absent or small amount of debris	1
Dry and moderate amount of debris	2
Dry and large amount of debris	3
Teeth	
Absent or small amount of debris	1
Moderate amount of debris	2
Almost covered with debris	3
Odor	
No unpleasant odor	1
Moderate degree of unpleasant odor	2
High degree of unpleasant odor	3

When the sum of the scores of two unconscious mouth-breathers obtained prior to the initial treatment was compared with the sum of scores gained following a program of mouth care with the Milk of Magnesia substrate, the difference between the scores was not significant ($P > 0.1$), so that the null hypothesis (1) was retained (Table 2)

<TABLE 2> Differences in Oral Conditions Prior to and After Treatments with Milk of Magnesia in Unconscious Mouth-Breathers

Item for evaluation	Scores prior to treatments	Scores following treatments
Saliva	6	4
Tongue	6	6
Palate	6	5
Gum & Mucous Membranes	5	6
Teeth*	3	2
Odor	6	4

* One patient had no teeth. $P > 0.1$

The two unconscious mouth-breathers had the worst oral condition in every area: the conditions looked better immediately following each mouth care session, but became worse again while waiting for the next mouth care session.

When the same method of treatment was applied to the first group of postoperative patients, the oral conditions became significantly improved ($P < 0.05$) and the null hypothesis (2) was rejected at 0.05 level (Table 3). Thus, when the same oral hygiene agent was applied to the

two different groups of patients—conscious and unconscious—at the same intervals, one group showed significant changes in oral conditions, while the other group did not.

<TABLE 3> Differences in Oral Conditions Prior to and after Treatments with Milk of Magnesia in Postoperative Patients

Item for evaluation	Score prior to treatment	Score following treatment
Saliva	4	3
Tongue	4	3
Palate	3	2
Gum & Mucous Membrane	2	2
Teeth*	2	1
Odor	3	2

* One patient had no teeth P<0.05

<TABLE 4> Differences in Initial Oral Conditions Between Unconscious and Postoperative Patients

Item to compare	Initial score of unconscious pt.	Initial score of postoperative pt.
Saliva	6	4
Tongue	6	4
Palate	6	3
Gum & Mucous Membrane	5	2
Teeth*	3	2
Odor	6	3

* Each group has one patient who had no teeth. P<0.001

When the initial oral conditions of the two unconscious patients were compared with those of the first group of postoperative patients, as shown in Table 4, the two groups of patients appeared to have significantly different oral conditions ($p < 0.001$). Therefore, the two groups are considered to be from different populations. The main causes of great difference between the initial oral conditions of the unconscious patients and the postoperative patients might be unconsciousness and mouth-breathing. Judging from the fact that the oral states of the unconscious patients did not change for the better

<TABLE 6> Differences in Oral Conditions of Two Groups of the Postoperative Patients

Item for evaluation	Saliva	Tongue	Palate	Gum & mucous memb.	Teeth	Odor
Milk of Magnesia	4	4	3	2	2	3
M.o.M. c chewing gum	4	4	2	2	3	4

$p > 0.1$

after mouth care with the Milk of Magnesia substrate, while those of the postoperative patients did, mouth care with the Milk of Magnesia substrate should be given more often for through chemical and mechanical cleansing. A piece of wet gauze might be placed on the mouth of the unconscious patient, if he has a patient airway in addition to the open mouth, to prevent dryness of the mouth due to mouth-breathing.

When the initial oral conditions of the second group of postoperative patients were compared with the conditions following two days' oral hygiene with the Milk of Magnesia substrate combined with the use of chewing gum between mouth care sessions, there was, as shown in <Table> 5, a significant difference at 0.05 level ($p < 0.05$) and the null hypothesis (3) was rejected.

The T-test of the two groups of the postoperative patients undergoing different methods of the

<TABLE 5> Differences in Oral Conditions Prior to and after Treatments with Milk of Magnesia and use of Chewing gum in Postoperative Patients

Item for evaluation	Score prior to treatment	Score following treatment
Saliva	4	2
Tongue	4	3
Palate	2	2
Gum & Mucous Membrane	2	2
Teeth	3	2
Odor	4	2

$p < 0.05$

treatment—Milk of Magnesia alone and Milk of Magnesia combined with chewing gum—showed that there were neither significant differences between the initial oral conditions of both groups ($p > 0.1$), nor significant differences between the final conditions of the same groups ($p > 0.1$).

Final oral condition	M.o.M.	3	4	2	2	1	2	$p > 0.1$
	M.o.M. + chewing gum	2	3	2	2	2	2	

The results indicated that the use of Milk of Magnesia at 7 or 8 hour intervals is enough to change the oral condition of the postoperative conscious patients for the better.

Summary and Conclusion

The major purpose of this study was to determine the effectiveness of the Milk of Magnesia substrate in the unconscious mouth-breathers and postoperative patients and the effectiveness of the Milk of Magnesia substrate combined with the use of chewing gum in the postoperative patients.

Data were collected through the first semester of 1969 from six patients at Long Hospital; two of which were unconscious mouth breathers and four of which were postoperative patients.

The finding of this study were as follows:

1. The oral conditions of the unconscious mouth-breathers did not improve after treatments with the Milk of Magnesia substrate at seven or eight hour intervals ($p > 0.1$).
2. The oral conditions of the postoperative patients improved after the same method of treatments at seven or eight hour intervals ($P < 0.05$).
3. The oral conditions of the postoperative patients improved with a program of mouth care using the Milk of Magnesia substrate combined with the use of chewing gum ($P < 0.05$). How-

ever, the two groups of the postoperative patients on the different methods of treatment Milk of Magnesia alone and Milk of Magnesia in combination with chewing gum did not show significant differences.

4. In critically ill patients, mouth care should be given more often and a piece of wet gauze may be placed on the mouth only if he has patient airway.

For further study more frequent use of the chewing gum between the mouth care sessions in a greater number of cases would be recommended.

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