The Effect of Metronidazole Mouth wash on Halitosis

H. Elyassi, M.D.*

Abstract

Bad breath is a common complaint and it is an important reason for patients' medical consultation. A large number of patients complaining of bad breath are treated ineffectively leading to their withdrawal from social activity. Metronidazole was used as gel to treat malodor of breast cancer and bed sores. This trial is done to find the effect of metronidazole mouth wash on bad breath of 162 patients referring to G1 clinic between 1990 to 1997. Metronidazole mouthwash for 2 minutes used for 7 to 14 nights before going to bed. The effect was evaluated by clinical examination and judged by McNemar test. 89 patients returned for follow-up. 80 patients (89.9%) had no more complaint (p<0.0001). So, it was concluded that metronidazole mouth wash is effective for bad breath. More clinical trials are recommended.

Key words: Halitosis, metronidazole, mouthwash

Introduction

Halitosis is a common complaint and patients may refer to medical, gastroenterology, ENT or dental clinics for treatment. It may be physiological, pathological or psychological. Management may include periodontal restoration treatment as well as simple treatment measures as instruction for keeping oral hygiene, tongue cleaning and mouth rinsing. Prevalence of halitosis is unknown but in USA about 25 million people complain of halitosis and 1 billion dollar is spent each year for its treatment.

Halitosis is an old complaint. There is history of treating it by pistica lenticus and cumin in ancient Rome and Chios. These are the same plants present in a Caravan which took Joseph to Egypt (Old Testament). Use of eucalyptus and mint as remedies for bad breath have a long history.

Halitosis seems to be produced by volatile sulfur compound such as hydrogen sulfide, methanethiol and dimethyl sulfide by anaerobic oral bacteria. Other causes such as tongue coating, gingival inflammation, systemic diseases such as diabetes mellitus, bronchiectasia, liver disease and uremia should be sought. To diagnose halitosis one can do self-examination, organoleptic evaluation or measure volatile sulfur compound by gas chromatography. By halitometer it was possible to show that 85-95% of bad breath comes from oral cavity and 5-15% from nasal fossae. At present, patients are treated by brushing teeth with tooth paste or chewing mint-flavoured pills but most of the patients do not improve leading to their social withdrawal and anxiety. We are informed of the effect of oral anaerobic bacteria as a cause of bad breath and the effect of metronidazole gel to treat malodor of breast cancer and bed sores. Is metronidazole gargle effective for bad breath? between 1990 to 1997, a study was made to answer this question.

Patients and Method

The clinical trial was performed by comparing patients before and after treatment. 162 patients (90 males and 72 females) aged between 10 to 69 years referred because the parents, spouse or patients themselves complained of malodorous breath. Clinical examination was normal for dryness of mouth due to atropine like drugs, tongue coating, gingival inflammation, sinusitis, bronchiectasia, hepatic failure, uremia, or diabetes mellitus. Metronidazole mouth wash was prescribed as 30ml each night before going to bed for 2 minutes. After 7 to 14 nights the effect was evaluated and confirmed by clinical examination and judged by McNemar test.

Results

This trial was performed on 162 patients of whom 89 returned. 80 of them (89.9%) got rid of bad breath according to parents, spouse or self-checkup proved by clinical examination. Table 1 shows the effect of treatment. In 9 patients (10.1%) there was no improvement. By McNemar test the difference was
significant (p<0.0001) and the effect of gargle was 89.99%. 

Table 1: The effect of Metronidazole mouth wash on halitosis

<table>
<thead>
<tr>
<th></th>
<th>Present</th>
<th>Absent</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bad breath after treatment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>9</td>
<td>80</td>
<td>89</td>
</tr>
<tr>
<td>Absent</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>80</td>
<td>89</td>
</tr>
</tbody>
</table>

Discussion

This trial showed the effectiveness of metronidazole mouthwash for bad breath. Literature review showed no such trial was done before. Metronidazole syrup is used for intestinal parasites, sepsis, foetid bed sores and malodorous cancer of breast. The question was how does metronidazole mouth wash work against bad breath? Does it inhibit bacterial over growth that produce volatile sulfur gas from post nasal discharge? Does it neutralize volatile sulfur compound produced by bacteria? Brushing teeth or chewing mint-flavoured pills had no apparent influence on sulfur compound. Having breakfast and tongue brushing result in strong trends towards decreased volatile sulfur compounds. Hydrogen peroxide mouthwash significantly reduces volatile sulfur compounds concentration. One time use of a chlorine dioxide containing mouth wash significantly reduces volatile sulfur compound concentration in mouth air for at least 8 hours after use. Considering prevalence of bad breath, stress and anxiety of patients suffering from bad breath a double blind study was done which was effective in 89.99%. Perhaps halitophobia is a cause of not responding to treatment. It is good to remind that after optic illusion and auditory illusion, smell illusion is the third commonest type of illusions. A questionnaire can be used to assess the psychological status of patients complaining of halitosis which enables the clinician to identify patients with psychosomatic halitosis. The Cornell medical index health questionnaire maybe a helpful tool for the diagnosis of patients who complain of halitosis. Infection by Hpylori as a cause of bad breath is another interesting subject to work on.

References


Further reading

Efficacy of Bath PUVA Therapy in Generalized Plaque Type Psoriasis

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Abstract
Psoriasis is a chronic inflammatory scaling disorder of the skin. Different patterns of psoriasis exist including plaque type, erythrodermic, pustular, palmoplantar and guttate. The most commonly involved sites are the elbows, knees, lumbosacral area and scalp. PUVA (Psoralen plus UVA) therapy is the administration of oral Psoralen followed by exposure to UVA (320 to 400nm) which is widely used to treat severe psoriasis. Oral PUVA produces some adverse effects that may limit its use in a number of patients. The carcinogenic potential limits its use in patients with psoriasis who probably have received other carcinogenic treatments. Oral PUVA has side effects such as nausea, vomiting and headache. Considering these problems, bath PUVA therapy is an important alternative to oral PUVA therapy.

Bath PUVA is a type of photochemotherapy in which UVA radiation is used after the administration of topical psoralen in a warm water bath. 30 patients with generalized plaque type psoriasis were treated with 8-MOP bath PUVA in Razi Hospital. Bath PUVA cleared psoriasis more rapidly than oral PUVA and required fewer sessions of treatment (mean number of sessions: 17.6±2.1) and lower cumulative UVA dose (49.2±15.4J/cm²). 83.3% of patients showed complete response to treatment and 13.4% had good response.

Key words: Bath PUVA, generalized plaque type psoriasis, psoraleen

Introduction
Topical antipsoriatic agents such as topical steroid, tar, cignolin are the main treatments of localized plaque type psoriasis, but for generalized plaque type psoriasis in which more than 30% of skin is involved, actually only limited treatments are available. One of the most common treatments of generalized plaque type psoriasis is oral PUVA by using oral methoxalen and UVA. Although systemic PUVA has some advantages, it has many side effects such as being carcinogen, vomiting and headache that in some patients cause discontinuation of the treatment.

Thus in the recent years, little by little, oral PUVA has gradually been replaced by bath PUVA. Bath PUVA is a kind of Photochemotherapy in which UVA radiation is used after the administration of topical psoraleen in a warm water bath.

Patients and Method
In this trial, 30 patients with generalized plaque type psoriasis were treated with 8-Methoxy Psoralen (8-MOP) bath PUVA in Razi Hospital of Tehran University of Medical Sciences between 1997 to 2000. The technique of bath PUVA therapy in this study was as following:

- Using warm water bath (between 30-37°C). 
- Water volume in bath was 150 liter.
- The concentration of 8-MOP was between 1-1.5mg/L.
- The length of bath PUVA therapy was 20 minutes.
- Initial dose of UVA was less than 30% of dosage of oral PUVA (almost 0.7 J/cm²).
- The dosage of UVA was added 0.5J/cm² every one or 2 session in respect to patient’s skin type and results.

Inclusion criteria
- Generalized plaque type psoriasis
- Involvement of more than 30% of skin areas
- Age of 18 years or above

Exclusion criteria
- Age less than 18 years
- History of liver or kidney disorders
- Active severe cardiovascular diseases
- Cataract and history of cataract surgery
- Photosensitive disorders such as systemic lupus erythematosus and porphyria
After selection of the patients, initially their PASI scores were determined. PASI (Psoriasis Area and Severity Index) is an international scoring for determining psoriasis severity. The score was determined from 0 to 4 based on severity of erythema, scaling and infiltration of lesions.

Percentage of involved area in the head, neck, upper extremity, trunk and lower extremity was also determined. The score range was between 0 to 6. With putting these scores in PASI formula, PASI score was detected. The range of PASI score is between 1 to 72. After determining the initial PASI score, treatment was started.

At the end of 10th and 20th sessions, patient’s PASI score and efficacy of bath PUVA were reevaluated.

Results
In this study, 30 patients with generalized plaque type psoriasis were treated with individualized bath PUVA. 18 of 30 patients (60%) were male and 12 patients (40%) were female. The range of age in patients was between 20 and 62 and 83% of patients were between 20 to 40 years of age. In table 1, relative frequency of different amounts of PASI score before treatment has been shown.

Mean PASI score of all patients before treatment was 34.7 ± 6.45, i.e. severe psoriasis (PASI score more than 18 is considered as severe psoriasis). The reduction quantity of PASI score after 10 and 20 sessions was determined in whole skin and also in 4 different sites of body. As one can see in table 2 the most reduction of PASI score (that means the most responsive site of body) after 10 sessions was seen in trunk that showed 63.5% reduction of its PASI score and the least reduction of PASI score was seen in lower extremity with only 39% PASI score reduction, but after 20 sessions of treatment, the median reduction of PASI score in all 4 different body sites was very good and between 88 to 98.1%. After completing 20 sessions, 25 of 30 patients showed complete response (more than 90% reduction of PASI score) and 4 patients showed good response (70-90% reduction), only one patient showed moderate response (50% reduction of PASI score). In table 3, the response of bath PUVA has been shown. By definition, more than 90% PASI score reduction is determined as excellent or complete response and 70-90% PASI reduction is considered as good response and moderate response is less than 70% PASI score reduction.

### Table 1: Pretreatment relative frequency of PASI score

<table>
<thead>
<tr>
<th>PASI score*</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-19</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>20-29</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>30-39</td>
<td>14</td>
<td>46.7</td>
</tr>
<tr>
<td>40-49</td>
<td>8</td>
<td>26.6</td>
</tr>
<tr>
<td>50-59</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

*PASI: Psoriasis Area and Severity Index

### Table 2: PASI* score reduction after 10th and 20th sessions of bath PUVA treatment

<table>
<thead>
<tr>
<th>Body site</th>
<th>Initial mean PASI</th>
<th>PASI after 10 sessions (%)</th>
<th>Reduction of PASI after 10 sessions (%)</th>
<th>PASI after 20 sessions (%)</th>
<th>Reduction of PASI after 20 sessions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head &amp; neck</td>
<td>2.7</td>
<td>1.4</td>
<td>48.1</td>
<td>0.3</td>
<td>88</td>
</tr>
<tr>
<td>Upper extremity</td>
<td>6.4</td>
<td>3.3</td>
<td>48.4</td>
<td>0.1</td>
<td>98</td>
</tr>
<tr>
<td>Trunk</td>
<td>10.7</td>
<td>3.9</td>
<td>63.5</td>
<td>0.2</td>
<td>98.1</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>14.9</td>
<td>9.1</td>
<td>39</td>
<td>0.5</td>
<td>96.6</td>
</tr>
<tr>
<td>Total</td>
<td>34.7</td>
<td>17.7</td>
<td>---</td>
<td>1.1</td>
<td>---</td>
</tr>
</tbody>
</table>

*PASI: Psoriasis Area and Severity Index
Table 3: Relative response frequency in bath PUVA

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete response</td>
<td>25</td>
<td>83.3</td>
</tr>
<tr>
<td>Good response</td>
<td>4</td>
<td>13.4</td>
</tr>
<tr>
<td>Moderate response</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

In 18 of 25 patients with complete response, the number of sessions was between 18 and 20 and 7 patients showed complete response after less than 18 sessions (Table 4).

Table 4: Number of sessions in bath PUVA therapy for complete response

<table>
<thead>
<tr>
<th>Number of sessions</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>18</td>
<td>12</td>
<td>48</td>
</tr>
<tr>
<td>20</td>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100</td>
</tr>
</tbody>
</table>

The mean PASI after 20 sessions in 30 patients was 1.15+0.5 that in comparison with initial PASI (3.75+8.45) with paired t-test indicated that the scores were significant. The mean total cumulative dose of UVA in times of complete response in all patients was 49.2±15.4 J/cm².

Discussion
To the knowledge of author, this study was done for the first time in Iran. 30 patients with generalized plaque type psoriasis in the age range of 20 to 62 years were treated with bath PUVA therapy and 83.3% of patients showed complete response after 20 sessions.

The mean number of treatment sessions was 17.6+2.1 and mean cumulative UVA dosage was 49.2±15.4 J/cm². The considerable reduction of cumulative UVA dosage in bath PUVA (15-60 J/cm²) will apparently reduce the carcinogenic effect of oral PUVA.

In the study that was done by Wiedow and Streit, 58 patients with chronic generalized Psoriasis were treated by bath PUVA. For the complete improvement, mean number of sessions was 17 and mean UVA dosage was 26 J/cm².10

The present study showed that bath PUVA is a very effective kind of treatment in generalized plaque type psoriasis and dermatologist can consider this method as a treatment of choice in generalized plaque type psoriasis.

In addition to psoriasis, recently, bath PUVA has been used in some other dermatologic disorders such as, generalized lichen planus14, prurigo nodularis5, pityriasis lichenoides6, mycosis fungoides7, localized scleroderma8 and progressive systemic sclerosis.9 Gradually oral PUVA will be replaced by bath PUVA therapy.

References