



## A study on the occurrence of bacterial isolation in mouth ulcer patients.

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### Abstract

**Objective:** Aim of the study is to observe the occurrence of bacterial isolates from mouth ulcer swab specimens. Recurrent oral ulcer gravely frightens every day of patient's life and health. This paper talks about the recurrent oral ulceration affecting the oral mucosa by bacterial infections.

**Methodology:** The study was carried out between April 2016 and June 2016. Mouth ulcer swab specimens were collected aseptically from patients and cultured on the appropriate bacteriological media. Bacterial isolates were identified by biochemical tests and antimicrobial susceptibility by standard methods.

**Result:** Out of 60 samples, 45(75%) specimens were found to have bacterial growth and 15 (25%) of them showed no growth. The prevalence of bacterial spp. isolated from the mouth ulcer swab are listed as follows *Acinetobacter baumannii* 17(37.8%), *Klebsiella pneumoniae* 12(26.7%), *Pseudomonas aeruginosa* 08 (17.8%), *Staphylococcus aureus* 05 (11.1%), *H.pylori* 3 (6.6%).

**Conclusion:** This study will be useful for prediction of the prevalence of pathogen in Mouth ulcer and also providing the alertness among the patients about its complications for control strategies of the pathogen.

**Keywords:** mouth ulcer swab, bacterial strains, antibiotic susceptibility.

### Introduction

The oral cavity is colonized by wide range of micro organisms which may be harmless or harmful to respective individuals based on the level of immunity. Recurrent oral ulceration is a common condition, experienced by most of the people which causes transient soreness and consequently may lead to prolonged ulceration in the mouth, It causes difficulty in eating and speaking. <sup>(1)</sup>

Many patients with recurrent oral ulceration maintain a good health but some may have pre-existing medical problems which may be of relevance that includes anaemia, blood dyscrasias, autoimmune disease and diabetes. The medical history will include ascertaining

medication taken by the patient. Some medications are associated with oral ulceration. <sup>(2)</sup>

“Ulcer is a complete breach of the epithelium”, this becomes covered by fibrin slough and it appears to be a yellow /white lesion surrounded by erythema. It is more common in women than men of 10 to 40 years of age. Mouth ulcer is more common in individuals who are under the pressure of physical or emotional stress for example: during exams, also occurs due to Trauma during dental procedure, aggressive tooth cleaning, eating more spicy food, biting of tongue or cheek accidentally, due to deficiency of vitamin B12 or folic acid, due to some hormonal changes and

sodium lauryl sulfate found in toothpaste also causes ulceration. Prolonged ulceration may leads to aphthous ulcer.

Aphthous ulcer are canker sores occurring in the mucous membrane of the mouth including gums , tongue and throat which may vary insize from 1-2mm to 1cm. It will be very painful , open mouth sores are in white or yellow colour with bright red surrounding area. It occurs in individuals of poor immune system.<sup>(3)</sup>

This study was conducted to evaluate the bacterial infections of recurrent oral ulceration.

## Materials and Methods

### Selection of Patients

The study was conducted in the Department of Microbiology. A total of 60 samples were collected from mouth ulceration in outpatients of SSSMC and RI, from April 2016 to June 2016. The patients presented with pain in the ulcer and redness of the surrounding area of the ulcer. They were registered at the General out patients department and their personal records: name, age, sex, occupation, contact address and other relevant information were taken.

## Results

**Table: 1 Bacterial isolates from mouth ulcer swabs**

1	<b>Growth</b>	45	75%
2	<b>Commensal</b>	15	25%
3	<b>Total</b>	60	100%

**Table:2 Prevalence of isolates in mouth ulcer swab culture**

Isolated organisms	Number of isolates	Percentage of bacteria
<i>Acinatobacter baumannii</i>	17	37.80%
<i>Klebsiella pneumoniae</i>	12	26.70%
<i>Pseudomonas aeruginosa</i>	08	17.80%
<i>Staphylococcus aureus</i>	05	11.1%
<i>H.pylori</i>	03	6.6%

### Collection of Samples

The patients were informed about the project and the swabs were taken with their consent. Mouth ulcer swabs were collected aseptically by a sterile swabs. The samples were sent to the Microbiology Laboratory immediately after collection of sample for analysis. Swabs were collected aseptically using sterile Evepon swab sticks. All the specimens collected were properly labelled with patient's number and date.<sup>(3)</sup>

### Examination of Samples

Ulcer swabs collected from mouth of the selected patients were examined microbiologically using culture technique and direct microscopy as described by Cruickshank et al., (1985) and Chesbrough (1998).<sup>(4),(5)</sup>

### Antibiotic Susceptibility Test

The antibiotic susceptibility of the bacterial isolates was tested using disc diffusion technique as in Cruickshank et al., (1985).<sup>(4)</sup> Commercially prepared single antibiotic discs were used for the study. The susceptibility test was done against microbial isolates by commercially used antibiotics like (Cefotaxime (30µg), Ceftazidime (30µg), Imipenem (10µg), Amoxicillin/clavulinate (20/10µg), Amikacin (30µg), Gentamicin (10 µg), Ciprofloxacin (5µg), Cotrimoxazole (25µg). Based on the drug , the susceptibility patterns varied from one bacterial isolates to the other.

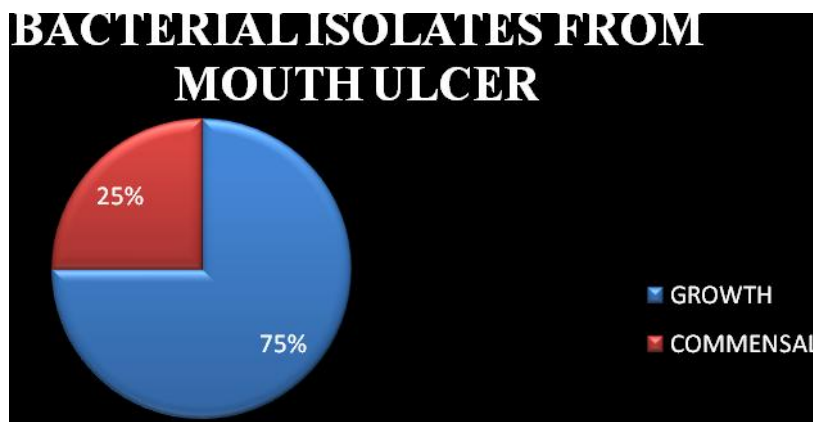


Figure:1 Distribution of bacterial isolates from mouth ulcer patients

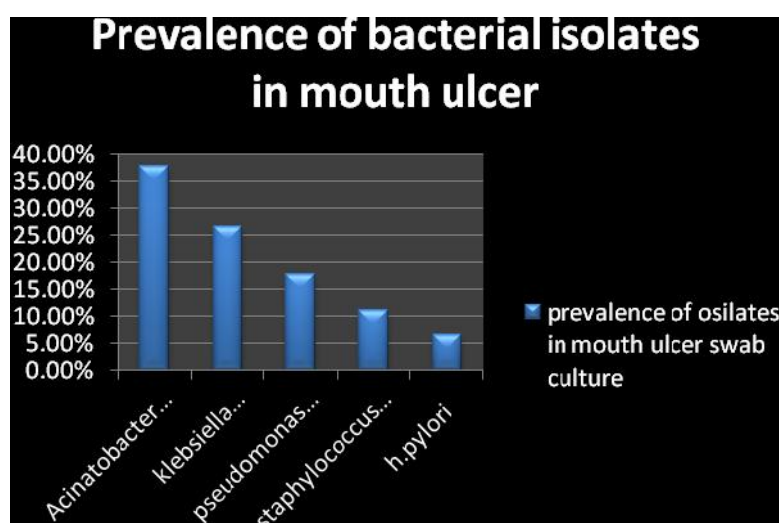


Figure:2 Prevalence of bacterial isolates in mouth ulcer swab

In this study, a total of 60 Mouth ulcer swabs were collected from the patients attending OPD in SSSMC& RI from a period of April to June 2016. Examination was done by proper microbiological procedure of culture technique and direct microscopy. Among which 45 (75%) samples were found to have bacterial growth and remaining 15 (25%) samples showed no growth as shown in the **Table1 : Fig:1**. All bacteria were tested for their susceptibility by using routinely used antibiotics.

**Table 2 and Fig 2** depicts the prevalence of bacteria in mouth ulcer swab. The prevalence of bacterial isolates *Acinetobacter baumannii* 17(37.8%), followed by *Klebsiella pneumoniae* 12(26.7%), then *Pseudomonas aeruginosa* 8 (17.8%), and *Staphylococcus aureus* 5 (11.1%), and finally *Helicobacter pylori*3 (6.6%) were detected in infections amongst patients examined at SSSMC & RI.

Among all the isolated bacteria, *Acinetobacter baumannii* 17 (37.8%) was found to be the most predominantly seen. The minimal number of organism isolated were *Helicobacter pylori*. This finding shows the prevalence rate of bacteria among the patients at variable ages who were suffering from mouth ulcer infection at the time of their sampling in the hospital. The control of mouth ulcer demands the availability of primary care and appropriate treatment.

### Discussion

The results of this study showed that 45(75%) specimens were found to have bacterial growth and 15 (25%) were showed no growth. The prevalence of bacteria spp. isolates such as *Acinetobacter baumannii* 17(37.7%), *Klebsiella pneumoniae* 12 (26.70%), *Pseudomonas aeruginosa* 8 (17.8%), *Staphylococcus aureus* 5 (11.1%), *Helicobacter pylori* 3 (6.6%).

This study showed that bacteria plays an important role in causes of infection in oral cavity.

This findings corroborates with Katsuji Okuda et al., who reported that *H. pylori* was the only organism responsible for most cases of mouth ulcer and in case of peptic ulcer and also in malignancy. <sup>(6)</sup>Some authors <sup>(7)</sup> have suggested that *H. pylori* may belong to the normal oral flora of the human oral cavity, maintaining a commensal relation with the host, but present in very low numbers such that reliable identification is difficult. The number of *H. pylori* organisms necessary to cause infection or disease in the stomach is unknown, and further studies are necessary to investigate whether the presence of *H. pylori* in the mouth is transient and whether there are risk factors that favour its growth in the oral cavity. <sup>(8)</sup>

AA Talacko et al., described that mouth ulcer may leads to aphthous ulcer. It may be due to viral causes such as HHV 1 and HHV 2 and coxsachie virus. But in contrast to our study, we depicts that the mouth ulcer are caused by bacterial species. <sup>(3)</sup>The aetiology of the condition is not completely understood but is thought to be immunologically-based. The study of previous researches have shown that the viruses <sup>(5)</sup>and fungi were the commonest cause for mouth ulceration. Unlike previous studies, We report that bacterial isolates of *Acinetobacter baumannii*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* are the major cause for mouth ulceration.

AA Talacko et al., also stated that ulceration due to bacterial infection, as in acute necrotizing ulcerative gingivitis (ANUG), may be recurrent. In this case, the successive bouts of ulceration along the gingival margins lead to blunting of the interdental papillae. ANUG tends to be more prevalent in winter months and there is an association with smoking. Recurrences may be more likely if the patient has compromised general health. <sup>(3)</sup>

The study of Nolan. A et al., <sup>(9)</sup> showed that, oranges, tomatoes, nuts, eggplant, tea and cola were the dietary allergens found to trigger of ulcer formation. Patients affected from mouth ulcer shows significant discomfort and may have difficulty eating and talking. Haematological problems can precipitate oral ulceration due to vitamin B12 deficiencies.

Many treatments have been advocated for recurrentaphthous ulceration. These may be based

upon antiseptics, antibiotics, corticosteroids, immunosuppressants, antirheumatics, anti-inflammatory, hormone therapy, antivirals, colchicine, thalidomide, pentoxifylline, sodium chromoglycate, interferon, hyaluronic acid, helicobacter eradication, zinc, various acids, gastric ulcer treatments, ultrasound, laser, cautery, cryotherapy, bioadhesives, herbal remedies, homeopathy, vitamins, lactobacillus as well as sundry other management strategies and combinations of various medications. <sup>(10,11)</sup>

More importantly, the latest research suggested that recurrent oral ulcer is a kind of oral disease induced by multiple factors. Therefore, it is necessary to study gene expression patterns in recurrent oral ulcer occurrence, development and recurrence. <sup>(12)</sup>

## Conclusion

The reasons for the mouth ulceration deficiency can be detected by haematological investigations and furthermore recurrent ulceration should be improved by suitable treatment, nutritional supplements and life style changes that may be helpful in treating and preventing mouth ulceration. Therefore, proper follow-up, improved personal hygiene, health education and treatment of each lesion will greatly reduce the complications of mouth ulcer. Thus, early diagnosis is an important aspect of patient management to control the bacterial infections.

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