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Anaerobic and Aero Tolerant Bacterial Profile of Halitosis

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Abstract: Bad breath "halitosis" is a frequent unpleasant odor of breath. Bad breath is infected by gram negative anaerobic bacteria in tongue coating. These bacteria have a tendency of producing foul-smelling sulphur containing gases called volatile sulphur compounds (VSCs). Both anaerobic and aero tolerant bacteria associated with human halitosis condition are being reported. The profile includes (Prevotella intermedia (6.66%), Porphyromonas endontalis (10%) and Veillonella spp. (13.3%). (Erysipelothrix rhusiopathiae (13.3%), Streptococcus salivarius (13.3%) and Streptococcus oralis (10%). This profile consists of commonal, soft tissue and hard tissue associated pathogen as well as an animal associated pathogens.

Keywords: Aerobic, Aerotolerant, Halitosis, Bacterial Profile

1. Introduction

Halitosis, oral malodor condition is multifactorial condition of human oral cavity. It may be a result of systemic disease such as gastrointestinal disorders, hepatic disease, diabetes, smoking and periodontal diseases(1). The most common mouth part related to halitosis is the tongue. Tongue associated bacteria produce malodorous compounds and fatty acids(2). Volatile sulfur compounds (VSCs)such as hydrogen sulfide, methyl mercaptan produce by oral bacteria in the stomium(3).The volatile sulfur compound are produced through Bacterial metabolism of sulfur amino acids such as cysteine and methionine(4). In various sites the oral cavity where they have easy access to nutrients in mouth microenvironment(5).

The foul- smelling breath produce in two steps;

(i) Deglycosylation of glycoprotein by Gram-positive bacteria.
(ii) proteolysis and amino acid utilization of the protein by Gram –negative bacteria[(6) (7) (8) (9)].

The objective of the present work is to report on the profile of anaerobic and aerotolerant bacterial profile of halitosis condition.

2. Main Body

Thirty halitosis condition were diagnosed by professional dentist and recommended to be abstain from eating odiferous food for 48 hr. before the assessment and refrain from drinking coffee, tea, or juice and smoking(10). Tongue coating material were swabbed by sterile cotton swab then immersed into tubes containing transport media. On reaching Laboratory swabs. were streaked on to Tripticase Soy Agar and Blood Agar plates in duplicate ,one for aerobic and the other for anaerobic culture procedures (11).Growth were identified through manual direct, culture, biochemical, antibiogram sensitivity, Api 20 A, and Vitek 2 system(12) (13) (14) (15).

3. Result & Discussion

The bacterial profile studies were shown in table 2,3,4,5 and 6. Anaerobic and aerotolerant bacteria were noted. There were including gram negative & gram positive bacteria from both cocci and rods. Commonsal, soft, and hard tissue associated pathogens were noted. Vitek 2 confirm Api 20 and both Api 20 and Vitek 2 confirmed the manual. identification methods and added species level ranking. Prevotella intermedia, Porphyromonas endontalis, Veillonella spp., Erysipelothrix rhusiopathiae, Streptococcus salivarius, Streptococcus orals. These findings were found in agreement with other workers tackling Halitosis Bacterial profiles (16,17,18).The frequency of isolation of these pathogens were higher in Halitosis than in control.

Table (1). *The characteristics of human study groups.*

Entity	Halitosis	Control
Age range	21- 60	21- 60
Age average	42.5 ± 10.9	36.73 ± 12.6
Sex		
- Male	17:30 (56.6%)	15:30 (50%)
-Female	13:30 (43.3%)	15:30 (50%)
Malodor	30:30(100%) Chronic Persistent	5:30(16.6%) Transient

Table (2). *Direct and Culture studies for patients and controls.*

Procedures	Halitosis	Control
Direct		
Gram Positive-	13:30 (28.3%)	4:30 (13.3%)
- Gram Negative	9:30 (30%)	4:30 (13.3%)
Culture:		
-Gram Positive	11:30 (36.6)	4:30 (13.3%)
Gram Negative-	9:30 (30%)	4:30 (13.3%)
Total	20:30 (66.6%)	8:30 (26.6%)

Table (3). *Profile of Culturable bacteria associated with Halitosis.*

A-
1- Commonsal
2- Associated soft tissue pathogen
3- Associated dental tissue pathogen
4- Animal associated pathogen
B-
1- Aerobic
2- Aerotolerant anaerobic
3- Strict anaerobic
C-
1- Gram positive rods
2- Gram positive cocci
3- Gram Negative rods
4- Gram Negative cocci

Table (4). *Special Potency Antimicrobial Disks for presumptive& Main Distinguishing Biochemical Characters Identification of Anaerobic and Aerotolerant Bacteria.*

Criteria	Microbes				
	Veillonella spp	***Prophyromonas spp***	***Prevotella spp***	***Erysipelothrix spp***	***Streptococcus spp***
Kanamycin (1000 mg)	S	R	S	V	S
Vanamycin (5 mg)	R	S	R	R	S
Collistin (10 mg)	S	R	V	R	R
Hemolysis	alpha	Beta	ND	Alpha	ND
Catalase	–	–	ND	–	–
Oxidase	–	–	–	–	–
Urease	–	–	–	–	–
H_2S (TSI)	+	+	+	+	+

Table (5). *Bacterial profile of Halitosis patients & Control.*

Bacterial groups			
A-Gram Negative:		Control	Halitosis
1	*Prevotella intermedia*	1:30 (3.33%)	2:30 (6.66%)
2	*Porphyromonas endontalis*	1:30 (3.33%)	3:30 (10%)
3	*Veillonella* spp	2:30 (6.66%)	4:30 (13.3%)
B- Gram positive			
1	*Erysipelothrix rhusiopathiae*	0:30 (0.0%)	4:30(13.3%)
2	*Streptococcus salivarius*	2:30(6.66%)	4:30(13.3%)
3	*Streptococcus oralis*	2:30(6.66%)	3:30 (10%)

Fig. 1. *Colonies of Erysipelothrix rhusiopathiae isolate on blood agar plate (48 hour incubation).*

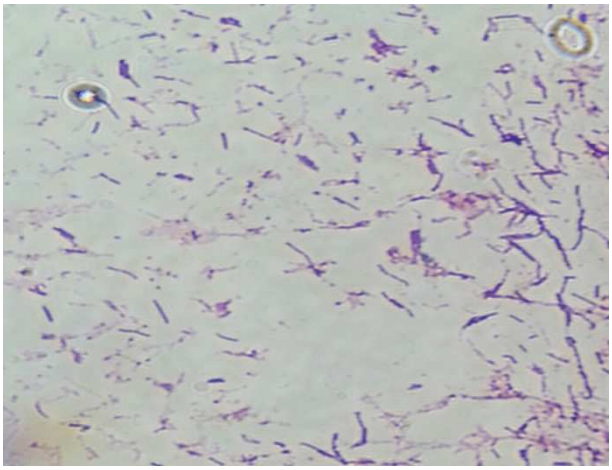

Fig. 2. *Gram- stained smear of Erysipelothrix rhusiopathiae.*

4. Conclusion

1. It affix that a part of multifactorial halitosis condition is bacterial associated.
2. The profile covers commousal, soft tissue associated pathogen, hard tissue associated pathogen as well as Un-successful animal associated pathogens.
3. Both gram positive & negative anaerobic and aerotolerantcocci and rods.

4. Prevotellaintermedia, Porphyromonas endontalis, Veillonellaspp, Erysipelothrix rhusiopathiae, Streptococcus salivarius and Streptococcus oralis.

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