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Delusional halitosis: Treatment outcome of a multidisciplinary approach

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Abstract

Objective: This study aims to validate a protocol for a multidisciplinary management of delusional halitosis and to assess their outcome of treatment.
Method: A prospective study of 61 patients with complaint of chronic bad breath and initial diagnosis of psychological halitosis after assessment with halitosis questionnaires and clinical examination. A final diagnosis of pseudo halitosis or delusional halitosis was made based on the patients' response to oral hygiene prophylaxis, antimicrobial treatment and counseling for 2 weeks. The delusional halitosis patients were treated in a 'Joint Clinic' of oral medicine physician and mental health experts, using a 5-step treatment protocol over a 4-week period. Treatment outcomes for the delusional halitosis patients were evaluated using patient's self-assessment, WHO well-being index, psychological score and other mental health instruments.
Results: There were 33 (54.1%) delusional halitosis patients among the psychological halitosis patients. Twenty (60.6%) patients out of the 33 (100%) delusional halitosis patients attended the 'joint clinic'. Six (30.0%) of the 20 treated patients had improved self-esteem, while only 1 (5.0%) and 3 (15.0%) showed improvement in state anxiety and trait anxiety respectively. Normal psychological score was found in 1 (25.0%) out of 4 (100%) patients that claimed to be 'cured', and 3 (50.0%) out of 6 (100%) patients had 'improved' final self-assessment.
Conclusion: Preliminary findings suggest early signs of recovery, with improvement in self-esteem, anxiety and psychological problems in delusional halitosis patients.

Keywords: Halitosis, Delusional, Multidisciplinary approach

Introduction

Several classification schemes exist for halitosis, although none is universally accepted.[1]
In 1999, Miyazaki[2] in a Japanese journal grouped halitosis into three main groups namely (i) Genuine halitosis (ii) Pseudo-halitosis, and (iii) Halitophobia (delusional halitosis). Omoregie and Akpata,[3] reclassified halitosis into genuine halitosis and psychological halitosis, where psychological halitosis was subdivided into delusional (halitophobia) and pseudo-halitosis. A delusional patient is a person that has irrational beliefs, a high level of conviction, a high resistance to change, even when the person is exposed to proofs that contradict their belief. The person may or may not come to the attention of the mental health providers.[4] Also, delusional halitosis patients usually have persistent complaint of oral malodour, even after confronting them with proofs that they have no halitosis clinically, and confirmed

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by a normal or below range of volatile sulphur compounds (VSC) level, and no growth or normal oral flora in the tongue culture.[4] These patients believe that their perceived bad breath is a cause of aversive reaction of persons around them. Consequently, the patients may suffer complete social isolation, poor communication, job loss, and very rarely suicide.[5-9] These patients fail to recognize their psychosomatic condition.[10]

Patients suffering from delusional halitosis are prone to obsessive behaviour. They avoid social interactions, and may even contemplate suicide.[11] Halitosis impairs quality of life, social interactions,[12] leads directly to depression.[13] low self-esteem or other mood disorders[14]. Individuals with delusional halitosis are reported to experience personal discomfort and social embarrassment leading to emotional distress.[7] Osagie in 2009[15] reported the occupational status of patients with delusional halitosis and the adverse effects of this condition on the subjects' performance at work (career), social interaction and normal lifestyle. Mental health assessment of delusional halitosis patients showed tough-mindedness, emotionality, suspiciousness, poor self-esteem and high anxiety to a specific situation. The instruments for the mental health assessment of delusional halitosis patients include Eysenck personality questionnaire (EPQ), Symptom distress checklist – 90 (SCL – 90), Spielberger's state- Trait Anxiety inventory (STAI), Self – Rating Depression scale (SDS), Index of self-esteem [ISE][16].

Generally, since the aetiology of halitosis is multifactorial, a multidisciplinary approach has been proposed by several authors.[4,6,17,18] This involves various specialties within dentistry and outside dentistry depending on the type of halitosis. However, delusional halitosis patients are reluctant to accept expert psychiatric help, because of the social stigma associated with psychiatric illness. But these patients are more tolerant of multidisciplinary care, where expert psychiatric care is provided together with dental care in the ambience of dental hospital.[4] The mental health assessment instrument is analyzed by the Clinical Psychologist to obtain the diagnosis of the personality of the patients.[4] The Psychiatrist handles the medical treatment of the patients using anti-psychotic medications. This study aims to report the outcome of treatment of delusional halitosis patients by a multidisciplinary team in a tertiary hospital.

Materials and methods

This was a prospective study carried out among patients with bad breath complaint seen in the Oral Medicine clinic in the University of Benin Teaching Hospital Benin City, Nigeria . The study was conducted over a period of 14 (fourteen) months after obtaining permission from the Ethics Committee of the Hospital and informed consent was obtained from all patients selected for this study.

Inclusion criteria

1. All patients with complaint of chronic bad who consented to participate in the study
2. Patients with complaint of chronic bad of both gender that were 16 years and above.
3. Patients who complained of chronic bad breath, but without clinical evidence of oral malodour using three judges' approach 3 and the Halimeter screening for VSC.
4. Patients who complained of chronic bad breath with a high psychological score from 4 to 10 in the standard halitosis questionnaire.
5. Patients with chronic bad breath complaint but normal oral flora or no microbial growth in tongue swab microscopy, culture and sensitivity (M/C/S)[3]
6. Patients previously diagnosed of psychological halitosis that met criteria 1 to 4 above but were not treated by mental health experts.

Exclusion Criteria

1. Patients who did not consent to join the study.
2. Patients below 16 years of age.
3. Patients with psychological score of 0 to 3 in the standard halitosis questionnaire.
4. Patients with clinical evidence of oral malodour.

Method

1. Patients that fulfilled the inclusion criteria were selected for this study.
2. The standard halitosis questionnaire was modified to collect information regarding the patient's complaint of bad breath, to determine the psychological score including the psychological problems and trigger factors.[11]
3. The W.H.O Well-being questionnaire was

administered to the patient to determine patient's well-being as at the time of presentation (baseline value),[19]

4. Clinical examination for halitosis was done using the three-judge approach to confirm the absence of genuine halitosis, before making initial clinical diagnosis of psychological halitosis.[3]
5. Microscopy, culture and sensitivity of swab taken from the posterior aspect of the dorsum of the tongue, were done and patient treated with placebo, where necessary.[3]
6. Scaling and polishing was performed and warm saline mouth bath was prescribed for the patient by the Periodontologist.
7. The results and findings from initial treatment with scaling and polishing and antibiotic therapy ('placebo') were used by the oral medicine physician for counseling the patient to recognize their problem as psychological and educate the patient on how to cope with the trigger factors for psychological halitosis.
8. Patient's response to treatment after counseling was documented using a baseline self – assessment form graded as worse, persistent, improved, cured oral malodour (subjective assessment of oral malodour).
9. Based on response to initial treatment and the value of the psychological score, psychological halitosis was subdivided into pseudo-halitosis and delusional halitosis.
10. Patients diagnosed of pseudo halitosis and delusional halitosis attended two sessions of counseling (over a 2-week period) on how to cope with their psychological problems and trigger factors conducted by the oral physician.
11. Final self-assessment form, final WHO well-being questionnaire and final modified halitosis questionnaire to determine the final psychological score (including final psychological problem) for these patients were administered.
12. Patients with delusional halitosis were then subjected to volatile sulphur compound (VSC) screening using the Halimeter.

Patients diagnosed with delusional halitosis were administered the mental health assessment instruments (Spielberger's state- Trait Anxiety inventory (STAI), Self – Rating Depression scale (SDS), Index of self-esteem [ISE].[16]

13. The clinical psychologist analyzed and produced a report of the mental health status of the patients from the mental health assessment instruments.
14. The mental health report was used by the psychiatrist and the clinical psychologist in treating the delusional halitosis patients in a joint clinical session comprising the oral physician (who presented the patients to the mental health experts), the Clinical psychologist who administered the psychotherapy (CBT) and the Psychiatrist who confirmed the diagnosis and prescribed appropriate treatment including use of antipsychotic therapy (medication) where necessary.
15. A 45-minute psychotherapy session every week for four weeks was instituted. Some patients were also given medication where necessary.
16. At the end of these sessions, the final patient's self-assessment, modified halitosis questionnaire (to assess final psychological score), W.H.O Well-being questionnaire and the mental health assessment instrument were administered and comparisons were made with the baseline of the same patient.

The scoring of all instruments used for mental health and well-being evaluation are explained in the relevant literature as mentioned below.

1. State-Trait Anxiety Inventory (STAI)
a. Form Y-1 (State anxiety)[20]
b. Form Y-2 (Trait anxiety)[21]
2. Index of Self-esteem (ISE)[22]
3. Zung's Self-Rating Depression Scale (ZSRDS)[23]
4. WHO well-being index score[24]

Results

A total of 33(54.1%) patients were diagnosed of delusional halitosis (using the spelt-out criteria in the methodology) from the initial 61(100%) patients who had psychological halitosis. Of the 33(100%) delusional halitosis patients scheduled for joint clinic sessions, 19(57.6%) were females; with a higher proportion in the age group 31 – 40 years [11(33.3%)]. The mean (standard deviation) age of the patients was 38.9(13.4) years. Most of the patients were students (n=13, 39.4%) and single (n=15, 45.5%) (Table 1)

Among the 33(100%) patients with delusional halitosis, 20(60.6%) attended the 'joint clinic',

while 13 were lost to follow-up. Among the 20(100%) patients that attended the joint-clinic, 17(85.0%) had cognitive behavioural therapy (CBT) alone, while 3(15.0%) had CBT and anti-psychotic medications.

The baseline mental health status of the 20 patients that attended the joint-clinic showed that 13(65.0%) had low self-esteem, 7(35.0%) had trait anxiety, 6(30.0%) had state anxiety, while none had clinical depression. Also, the final mental health status of the 20 patients show that 11(55.0%) had low self-esteem, 7(35.0%) had trait anxiety, 6(30.0%) had state anxiety, while none of the patients had clinical depression (Table 2).

Two 2(10.0%) of the delusional halitosis patients experienced worsened low self-esteem, 6(30.0%) patients had improved low self-esteem and 12(60.0%) patient's self-esteem remained unchanged. Also, 2(10.0%) patients had increased state anxiety, 1(5.0%) patient had reduced state anxiety, while 17(85.0%) patients state anxiety remained unchanged. With respect to trait anxiety,

Table 1: Socio-demographic status of the patients

Characteristics	Frequency (n=33)	Percent
Gender		
Male	14	42.4
Female	19	57.6
Age group (years)*		
11 – 20	2	6.1
21 – 30	9	27.3
31 – 40	11	33.3
41 – 50	4	12.1
51 – 60	4	12.1
61 – 70	3	9.1
Occupation		
Self-employed	2	6.1
Students	13	39.4
Employed full time	2	6.1
Applicant	1	3.0
Employed part time	7	21.2
Retired	5	15.2
Homemaker	3	9.1
Marital status		
Single	15	45.5
Married	12	36.4
Separated	5	15.2
Divorced	1	3.0
Educational status		
First school leaving certificate	1	3.0
SSCE	12	36.4
OND	5	15.2
HND	1	3.0
University and above	13	39.4
Not specified	1	3.0

Analysis of the findings of the joint clinic

Table 2: Joint clinic treatment outcome among delusional halitosis patients

Mental Health	Baseline		Final		Total
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	n (%)
Low self-esteem	13(65.0)	7(35.0)	11(55.0)	9(45.0)	20(100.0)
Trait anxiety	7(35.0)	13(65.0)	7(35.0)	13(65.0)	20(100.0)
State anxiety	6(30.0)	I4(70.0)	6(30.0)	I4(70.0)	20(100.0)
Clinical depression	0(0.0)	20(100.0)	0(0.0)	20(100.0)	20(100.0)

**Multiple responses*

Table 3: Change in mental health status of patients with delusional halitosis following treatment in the Joint clinic

Variables	Frequency (n = 20)	Percent
Low self-esteem		
Worse	2	10.0
Improved	6	30.0
Same	12	60.0
State anxiety		
Worse	2	10.0
Improved	1	5.0
Same	17	85.0
Trait anxiety		
Worse	2	10.0
Improved	3	15.0
Same	15	75.0

Table 4: Treatment modality and psychological assessments

Variables	Treatment modality		Test statistics*	p-value
	CBT (n = 17)	CBT & medication (n = 3)		
Final self-assessment				
Cured	3 (17.6)	1 (33.3)	3.660	0.158
Improved	4 (23.6)	2 (66.6)		
Persistent	10 (58.8)	0 (0.0)		
Psychological score comparison				
Normal	3 (17.6)	1 (33.3)	4.314	0.114
Improve (Final < Baseline)	1 (5.9)	1 (33.3)		
Same (Final = Baseline)	10 (58.9)	0 (0.0)		
Worse (Final > Baseline)	3 (17.6)	1 (33.3)		
WHO well-being score comparison				
Same	6 (35.3)	0 (0.0)	1.569	0.553
Reduced / worse	3 (17.6)	1 (33.3)		
Increased / improved	8 (47.1)	2 (66.6)		
STAIY-1 (State anxiety) comparison				
Same	14 (82.4)	3 (100.0)	0.623	0.702
Increased	2 (11.8)	0 (0.0)		
Cured	1 (5.8)	0 (0.0)		
STAIY-2 (Trait anxiety) comparison				
Same	13 (76.4)	2 (66.6)	1.176	0.601
Increased	2 (11.8)	0 (0.0)		
Cured	2 (11.8)	1 (33.4)		
ISE (Self-esteem) comparison				
Same/high	6 (35.3)	0 (0.0)	12.157	0.018
Improved (low to high, cured)	1 (5.9)	1 (33.3)		
Improved (low)	3 (17.6)	0 (0.0)		
Worse	1 (5.9)	1 (33.3)		
Same (low)	6 (35.3)	0 (0.0)		
Improved (normal to high)	0 (0.0)	1 (33.3)		

*Fisher's exact test

Table 5: Final self-assessment by Psychological score comparison and WHO well-being score comparison of delusional halitosis patients

Variables	Final self-assessment			Test statistics*	p-value
	Cured (n = 4)	Improved (n = 6)	Persistent (n = 10)		
Psychological score comparison					
Normal	1 (25.0)	3 (50.0)	0 (0.0)	7.686	0.195
Improve (Final < Baseline)	1 (25.0)	0 (0.0)	1 (10.0)		
Same (Final = Baseline)	2 (50.0)	2 (33.3)	6 (60.0)		
Worse (Final > Baseline)	0 (0.0)	1 (16.7)	3 (30.0)		
WHO well-being comparison					
Same	2 (50.0)	2 (33.3)	2 (20.0)	3.590	0.525
Reduced/worse	1 (25.0)	0 (0.0)	3 (30.0)		
Increased/improve	1 (25.0)	4 (66.7)	5 (50.0)		

*Fisher's exact test

2(10.0%) patients had increased trait anxiety, 3(15.0%) patients had reduced trait anxiety, while 15(75.0%) patient's trait anxiety remained unchanged (Table 3).

Of the 17(100%) delusional halitosis patients that had CBT alone, 3(17.6%) patients were 'cured', and 4(23.6%) patients experienced improvement. Among the 3(100%) delusional halitosis patients that had CBT and medication, 1(33.3%) patient was 'cured' and 2(66.6%) patients experienced improvement. The relationship between treatment modality and final self-assessment was not statistically significant (p=0.158) (Table 4). Of the 17(100%) delusional halitosis patients that had CBT alone, 3(17.6%) patients had worse psychological score, and 10(58.9%) patients had no improvement in their psychological score. Among the 3(100%) delusional halitosis patients that had CBT and medication, 1(33.3%) patient had worse psychological score. The relationship between treatment modality and psychological score was not statistically significant (p=0.114) (Table 4). Of the 17(100%) delusional halitosis patients that had CBT alone, 6(35.3%) patients had same WHO well-being score, and 8(47.1%) patients had improved WHO well-being score. Among the 3(100%) delusional halitosis patients that had CBT and medication, 2(66.6%) patients had improved WHO well-being score. The relationship between treatment modality and WHO Well-being score was not statistically significant (p=0.553) (Table 4).

Of the 17(100%) delusional halitosis patients that had CBT alone, 14(82.5%) patients had same/unchanged STAIY-1 (state anxiety). All the 3(100 %) patients that had CBT and medication had same /unchanged STAIY-1 (state anxiety). The relationship between treatment modality and state anxiety was not statistically significant (p=0.702). Thirteen (76.4%) of the delusional halitosis patients that had CBT alone while 2(76.4%) of those who had CBT and medication had same STAIY-2 (trait anxiety). The relationship between treatment modality and trait anxiety was not statistically significant (p=0.601). Six (35.3%) of the delusional halitosis patients that had CBT alone had same self-esteem. The relationship between treatment modality and self-esteem was statistically significant (p=0.018) (Table 4).

One (25.0%) out of 4(100%) patients that were 'cured' on final self-assessment had 'normal' psychological score compared to 3(50.0%) out of 6(100%) who had 'improved'. None of the patients with 'persistent' on final self-assessment had 'normal' psychological score. The relationship between final self-assessment and psychological score comparison was not statistically significant (p=0.195) (Table 5). Two (50.0%) out of the 4(100%) patients who were 'cured' on final self-assessment had 'same' (baseline = final) WHO well-being score comparison compared to 2(33.3%) out of 6(100%) of those who had 'improved', and 2(20.0%) out of 10(100%) of those who had 'persistent' on final self-assessment. The relationship between final self-assessment and WHO well-being score comparison was not statistically significant (p=0.525) (Table 5).

Discussion

A multidisciplinary approach in the management of genuine and psychological halitosis has been recommended by previous studies.[25] Recently, a team approach involving the dentist and the mental health experts (Clinical psychologist and Psychiatrist) in a 'stop gap' treatment protocol have been recommended in a Nigerian study.[3] Evaluation of compliance to the 'stop gap' treatment protocol recorded a high compliance at the diagnostic and initial treatment/counseling phase. This 'stop gap protocol' was only effective for treatment of pseudo halitosis cases. There was poor response of the delusional halitosis patients to initial treatment/counseling and they were referred to the joint clinic of dentist and mental health experts.[26] This study showed a female predilection, with peak age group at the fourth decade of life. Most of the patients were singles and university undergraduates. Similarly, a study of psychogenic halitosis in a breath clinic reported a female predilection for these patients. Whereas some other studies have reported male predilection for patients with psychological halitosis.[3,26,27] The findings above suggest gender variation and a higher impact of the adverse effect of delusional halitosis in young adults who are at their most productive stage in life.

Of the 33 delusional halitosis patients referred to the joint clinic for expert management, 20(60.6 %) patients presented at the joint clinic. This study recorded a better compliance compared to earlier

studies.[26,28] A previous study reported a lower compliance of 4.6% to referral to the joint clinic.[35] The high level of compliance recorded in this study may be due to the use of the recommended checklist[26] and aggressive follow up of these patients. The baseline mental health assessment of the patients showed state anxiety (30%), trait anxiety (35%) and low self-esteem (65%) in the patients at the joint clinic. These findings are supported by previous studies that reported anxiety and low self-esteem as common psychosocial problems encountered by halitosis sufferers.[29,30,31] None of the patients had clinical depression. Similarly, previous studies[5,6,16] have reported that delusional halitosis patients are a monosymptomatic type of delusion disorders which rarely causes clinical depression in sufferers. Most of the patients were treated with cognitive behavioral therapy (CBT) alone (85%) administered, while 25% cases were treated with CBT and medication. This treatment approach is in keeping with several literature that support the use of CBT, and where necessary antipsychotic medication may be used in the management of delusional disorders.[29,30,32,33]

Preliminary assessment of the patients' treatment outcome was done after a 4-week follow up period. However, long term follow-up of patients for at least 2 years is recommended[9]. The instruments used for patients' assessment were patients' final self-assessment (subjective assessment) and objective assessment using comparison of patients' psychological score and psychological problems (baseline versus final), comparison of WHO well-being index (Baseline versus final) and comparison of mental health assessments. The treatment outcome of delusional halitosis patients who attended the joint clinic was measured by patients' final self-assessment, comparison of the baseline and final psychological score and psychological problems, comparison of WHO well-being index and comparison of mental health assessment instruments (using STAI, ISE, and ZSRDS components standardized for delusional halitosis, while EPQ and SCL-90 were not used).[7]

This study showed that half (50%) of the patients with delusional halitosis had final self-assessment of persistence of bad breath. Similarly, persistent bad breath has been reported in a delusional halitosis patient among 3 solitary psychosis patients treated with medication and cognitive behavioural therapy and followed up for about 2 months[30] Other patients in this study claimed they had improved (30%) and cured (20%) bad breath. Whereas, objective assessment of the treatment outcome using final psychological score showed that 20% patients among the 20 treated delusional halitosis patients recovered into normal range of psychological score, while 20% patients showed a reduction in psychological score, which signified an improvement in the patients' psychological problems. Furthermore, Beary and Cobb[30] also reported improvement in the social interactions and daily living among the solitary psychosis patients. However, they were still concerned about people's perceived aversive behaviour towards them but chose to ignore them. These findings are comparable to the treatment outcome for delusional halitosis patients with improved psychological problems reported in this study.

Correlation of treatment modality with comparison of the baseline and final WHO well-being score of delusional halitosis patients showed an improvement in WHO well-being score in 50% patients, while the WHO well-being score of 30% patients did not change and 20% patients had a worse WHO well-being score after a 4-week follow up period. There was no significant association between the patients' final self-assessment and comparison of WHO well-being scores of the delusional halitosis patients. However, a previous study reported that the measurement of patients' well-being using WHO well-being index was significantly superior to mental health subscale used for assessment of patients' distress symptom in cases with depression.[19] Possibly a longer period of follow-up would have given significant findings with WHO well-being index in this study.

The mental health assessment of these patients showed increased (25%), persistent (30%) and recovery (15%) in the level of anxiety (state and trait) among the delusional halitosis patients. However, there was no significant association between the patients' final self-assessment and comparison of mental health assessments of anxiety for the delusional halitosis patients in this study. However, the early recovery from anxiety observed in some of the patients suggest that delusional

halitosis patients may show significant improvement in mental health assessment of anxiety after the recommended long term follow up period of about two years.[9] Also, there was improvement of self-esteem in 30% of the patients, while 20% of the patients had low/worse self-esteem compared to baseline findings. There was significant association between the patients' final self-assessment and the self-esteem of the patients. Therefore, assessment of patients' self-esteem is recommended as a mental health assessment instrument to determine early response of delusional halitosis patients to treatment in the joint clinic.

Conclusion

A 5-step multidisciplinary treatment protocol in the joint clinic (within the ambience of the dental clinic) involving the oral physician, Clinical psychologist and the Psychiatrist have been developed and used for the treatment of delusional halitosis patients. Preliminary findings showed early response in these patients such as recovery from anxiety and psychological problems and improvement in self-esteem, following treatment with CBT with or without medication. The patient's self-assessment and the index of self-esteem are recommended as useful tools for assessment of patient's treatment outcome.

Conflict of interest: Nil

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