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Original Article

Dentistry Section

Appraisal of Oral Hygiene Status amongst Subjects with Suicidal Leanings-A Pilot Study

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ABSTRACT

Introduction: Suicide is an alarming social problem affecting the society at large causing a high mortality rate especially in the younger generation. Suicide is one of the top three causes of death among youth worldwide.

Aim: The aim of the study was to draw a correlation between an alteration in one's oral hygiene regimen and an innate suicidal tendency in an individual.

Materials and Methods: This double blind cross-sectional study was conducted in a suicide prevention centre, a Non-Governmental Organisation (NGO) at Chennai. A total of 78 subjects (age 22-50 years) participated in the study. They were divided into two groups-Group A and Group B. Participants in Group A had attempted suicide at least once in the past one year. Participants in Group B had only threatened to commit suicide. Both Group A and B participants were attending counseling sessions at the centre. In addition to this, the Group A participants were also undergoing psychiatric therapy and taking anti-psychotic medications. Oral examination was done using a mouth mirror, probe and explorer. A printed questionnaire was also circulated to collect patient's information like tooth brushing habits, smoking and their employment status. The statistical analysis was done using chi-square tests.

Results: The participants in Group A had poorer oral hygiene index scores and clinical attachment loss scores than those in Group B. There was also a statistically significant association between the frequency of changing a tooth brush in Group A and Group B. The socioeconomic status of participants in Group A and Group B also showed a statistical significance. Based on the above findings it was found in this pilot study that there was a correlation in oral hygiene status and suicidal tendencies.

Conclusion: The oral hygiene levels in the participants who had attempted suicide were poorer than that of the participants who had not actually attempted suicide.

Keywords: Poor oral hygiene, Smoking, Stress, suicide, Tooth brushing

INTRODUCTION

Maintenance of proper oral hygiene is the cornerstone of good oral health. Neglect in oral hygiene causes oral malodor and microbial plaque formation leading to gingivitis, periodontitis, furcation problems, loss of tooth and also various systemic problems. A proper patient motivation and education along with periodic dental visits are required for maintenance of good oral hygiene which in turn results in good oral health [1]. There is an unmistakable link between the dental and the mental status of any individual [2]. Practice of a vigorous oral hygiene regimen like tooth brushing and flossing, requires a well-informed and a well-motivated mindset.

Suicide is the act of intentionally causing one's own death [3]. Multiple risk factors like an innate personality disorder, coping problems, hallucination tendencies, an underlying schizophrenia, substance abuse, alcoholism, depression and bipolar disorders are amongst the many reasons cited for the act of 'committing suicide'. Mental illness: although one of the causes for suicide is not the only cause of this devastating social problem [4]. The destruction or ruin of one's own interests is a prelude to the final act of suicide. Research has shown that most individuals who commit suicide express a desire to do so either verbally or in written form before they carry out the fatal act [5]. Warning signals like neglect in personal grooming or a sudden change in body weight (excessive gain or loss) can be noticed in a person with suicidal tendencies (Farlex's dictionary). Maintenance of oral hygiene is also a part of personal grooming and oral health is an important parameter to gauge both physical and mental health [2]. Attempting suicide, besides being a punishable offense under Indian Penal Code (IPC) section 309, is also considered a taboo topic, often discussed behind closed doors [6].

Although there have been innumerable studies on the association between stress and oral hygiene, there have been no studies so far linking suicidal tendencies and oral hygiene levels. In that aspect, this was the first study on the topic, and hence it makes the study more relevant. A deteriorating oral hygiene status in a person having suicidal tendencies can serve as a warning in the future to identify such people. Since the number of participants in our study were less, a non-invasive pilot study was conducted which aims to assess the oral hygiene status in subjects with suicidal tendencies.

MATERIALS AND METHODS

A double blinded, pilot study was conducted in 100 subjects attending counseling sessions in a suicide prevention center (NGO) at Chennai, Tamil Nadu on grounds of absolute anonymity. The participants included in the study, had to sign a written consent form. Only those subjects who had a minimum of 24 teeth were included in the study. Diabetic patients, pregnant women and others with a known history of cardiovascular defects, asthma and other systemic illnesses were excluded from the study. Subjects involved in substance abuse, those exhibiting an excessive violent behaviour and those with poor communication skills were also excluded from the study. None of the subjects in the study were suffering from any mental disorder which requires hospitalisation. Some of the subjects were taking medications as part of the treatment regimen for stress and anxiety.

The Ethical committee clearance was obtained from the authorities in the counseling centre. The participants in the study were chosen based upon the recommendations from the counselors and the centre volunteers. Subjects who were recommended by the counselors were articulate, not suffering from any mental illnesses and they exhibited a willingness to take part in this study.

This study was conducted from February 2017 to October 2017 on Friday afternoons. Since no known references were available for the study involving subjects with suicidal tendencies, a pilot study involving a small sample size of 100 participants only was conducted. During the period of the study, 22 participants abruptly left the study

(10 men and 12 women). Therefore the total number of participants was reduced to 78. The age group of the participants varied from 22-50 years; there were 47 men and 31 women in this study.

The subjects were divided into two groups-Group A consisted of 40 subjects who had attempted suicide at least once in the past one year. They were taking medicines like diazepam, sodium valproate and imiprazole under the guidance of a psychiatrist in the centre.

Group B consisted of 38 subjects who had threatened to commit suicide in the past one year. They were attending only the counseling sessions, and were not taking any medicines.

A printed questionnaire was given to each one of the subjects, to assess their oral hygiene regimen. Other information regarding their personal habits like smoking, tobacco chewing, their socioeconomic details and education levels were also included in the questionnaire. The questionnaire was taken from an Ethiopian study [7] and modified to the requirements of the current study. The validation of the questionnaire was done to suit the population of Chennai (kappa value greater than 0.7).

The dental parameters were recorded using a mouth mirror and a no. 23 explorer according to criteria of simplified Oral Hygiene Index (OHI-S) by Greene and Vermillion [8]. Clinical parameters like Clinical Attachment Loss (CAL) were also recorded. CAL was measured using a William's graduated probe at six sites per tooth [1]. The statistical analysis was done using chi-square tests.

RESULTS

Out of the 78 participants in the study, there were 47 men and 31 women in the age bracket 22-50 years. There were 40 participants in Group A and 38 in Group B. The participants in Group A had attempted suicide at least once in the past one year. They were being treated by a psychiatrist. All of them were consuming medicines for problems like depression, epilepsy or sexual dysfunction. They were having medicines like chloromazine, diazepam, sodium valproate and imipramine. The participants in Group B had only threatened to commit suicide; they were only attending counseling sessions and were not under any medications.

Dental parameters: The OHI-S values and CAL values were poorer in Group A compared to Group B. Both the results were statistically significant (p<0.05) [Table/Fig-1].

	Group	n	Mean	Std. Deviation	Std. Error mean	
Age	Group B	38	32.2105	6.61349	1.07285	0.713
	Group A	40	31.7250	4.89368	0.77376	
OHI-S	Group B	38	1.6553	0.92025	0.14928	0.002
	Group A	40	2.4950	1.33243	0.21068	
CAL	Group B	38	3.8421	0.91611	0.14861	<0.001
	Group A	40	4.6250	0.83781	0.13247	

[Table/Fig-1]: Comparison of Age, OHI-S, CAL between Group A and Group B.

Brushing habits/tooth brush change/dental visits: Thirty seven participants in Group A and 31 participants in Group B brushed their teeth atleast once a day. Seven participants in Group B and three in Group A brushed their teeth more than once a day. This was not considered statistically significant. Seven participants in Group B and 2 participants in Group A spent more than 5 minutes per day on tooth brushing. Twenty two out of the 38 participants in Group B changed their tooth brush at least once in six months whereas only one person in Group A changed his tooth brush once in six months. This result was found to be highly significant (p-value=0.001).

A total of 69 participants out of the total 78 did not feel the need to visit the dentist. This result was of no statistical significance [Table/Fig-2].

S. No.	Question		Count	Group		Total	p-value
				Group A	Group B		
Q1	How often do you brush your teeth?	a) Once a day	% within q1	37 (54.4%)	31 (45.6%)	68 (100%)	0.149
		b) >Once a day	% within q1	3 (30%)	7 (70%)	10 (100%)	
	Total		% within q1	40 (51.3%)	38 (48.7%)	78 (100%)	
Q2	How long do you spend on brushing your teeth?	a) Less than 5 minutes	% within q2	38 (55.1%)	31 (44.9%)	69 (100%)	0.064
		b) More than 5 minutes	% within q2	2 (22.2%)	7 (77.8%)	9 (100%)	
	Total		% within q2	40 (51.3%)	38 (48.7%)	78 (100%)	
Q3	How often do you change a tooth brush?	a) Once in 6 months	% within q3	1 (4.3%)	22 (95.7%)	23 (100%)	<0.001
		b) Once a year	% within q3	39 (70.9%)	16 (29.1%)	55 (100%)	
	Total		% within q3	40 (51.3%)	38 (48.7%)	78 (100%)	
Q4	How often do you visit a dentist	a) Once a year	% within q4	4 (44.4%)	5 (55.6%)	9 (100%)	0.663
		b) never	% within q4	36 (52.2%)	33 (47.8%)	69 (100%)	
	Total		% within q4	40 (51.3%)	38 (48.7%)	78 (100%)	
Q5	Do you smoke more than 10 cigarettes per day?	a) more than 10 cigarettes per day	% within q5	22 (56.4%)	17 (43.6%)	39 (100%)	0.365
		b) less than 10 cigarettes per day	% within q5	18 (46.2%)	21 (53.8%)	39 (100%)	
	Total		% within q5	40 (51.3%)	38 (48.7%)	78 (100%)	
Q6	Do you chew tobacco?	a) chew tobacco	% within q6	14 (70%)	6 (30%)	20 (100%)	0.052
		b) don't chew tobacco	% within q6	26 (44.8%)	32 (55.4%)	58 (100%)	
	Total		% within q6	40 (51.3%)	38 (48.7%)	78 (100%)	
Q7	Do you consume white sugar in any form (more than 5 Table spoons per day)?	a) more than 5 table spoons a day	% within q7	36 (52.9%)	32 (47.1%)	68 (100%)	0.445
		b) less than 5 table spoons a day	% within q7	4 (40%)	6 (60%)	10 (100%)	
	Total		% within q7	40 (51.3%)	38 (48.7%)	78 (100%)	
Q8	Have you completed your graduation?	a) completed graduation	% within q8	29 (46%)	34 (54.%)	63 (100%)	0.057
		b) Not completed graduation	% within q8	11 (73.3%)	4 (26.7%)	15 (100%)	
	Total		% within q8	40 (51.3%)	38 (48.7%)	78 (100%)	
Q9	Is your monthly income?	a) <10,000 Rs per month	% within q9	26 (43.3%)	34 (56.7%)	60 (100%)	0.010
		b) >10,000 Rs per month	% within q9	14 (77.8%)	4 (22.2%)	18 (100%)	
	Total		% within q9	40 (51.3%)	38 (48.7%)	78 (100%)	

[Table/Fig-2]: Comparison of subject's responses to the questionnaire between Group A and Group B.

Smoking/tobacco chewing/sugar intake: There were 17 male smokers in Group B and 22 male smokers in Group A (those who smoked more than 10 cigarettes /day). None of the female participants in this study had a smoking habit. Total 14 participants in Group A had a tobacco chewing habit whereas only six participants in Group B used tobacco. A total of 68 participants in present study consumed sugar (more than five table spoons of white sugar per day; sweets, chocolates, sweet beverages were also included); there were no diabetic patients in current study. The above mentioned three parameters did not show any statistical significance [Table/Fig-2].

Educational levels/Socioeconomic status: A total of 29 participants in Group A and 34 participants in Group B had completed their graduation. Fourteen participants in Group A and four participants in Group B had a monthly income of less than 10000 Rs. This was found to be statistically significant. (p-value= 0.010) [Table/Fig-2].

DISCUSSION

Suicide is a matter of grave concern to the society at large. The word suicide was first used by an English author, sir Thomas Browne in 1642. It is a combination of two words sui (meaning of oneself) and Caedes (meaning murder) [6].

Several studies on suicide conducted in India have reported incidence rates ranging from 2.36 to 42/10,000 population. There was a 5.9% increase in a 2010 National Crime Records Bureau (NCRB) report. Suicidal deaths are often converted to accident or illness to avoid legal hassles involving the police [6]. According to a statistical study in Madurai, Tamil Nadu, it was revealed that one in 12 cases of suicide attempts resulted in deaths [6]. Another study showed that attempted suicide is more common among women whereas completed suicide (death) is commoner in men [9].

Stress is a common risk factor for both suicide and maintenance of poor oral hygiene [10]. A latent stress factor triggers habits like alcohol consumption and cigarette smoking which is a known risk factor for periodontal disease [11,12]. Stubborn nicotine stains can also leads to deterioration in one's oral hygiene [13].

In this study, the participants in Group A exhibited a poorer oral hygiene status than those in Group B. This was in accordance with a study on the oral health status of patients with mental disorders in South West Ethiopia [7]. It was concluded in the above study that the oral health status of patients undergoing psychiatric therapy was poor. This was largely attributed to other confounding factors like smoking and khat (a type of local tobacco) chewing. Group A in this study also had a larger number of smokers and tobacco users than Group B.

The OHI-S scores and the CAL values were significantly higher among males compared to females in this study. This result was similar to a study conducted in Jordan comparing male and female gender in maintaining oral hygiene. According to Radhakrishnan R et al., the most common age group for suicide is between 15 to 29 years (38 per 100,000 population) [6]. This study group was in the range of 22 to 50 years with only four participants over 40 years (three men and one woman). All four of them had a monthly income of more than 10000 Rs, were graduates and they exhibited good OHI-S scores. They also brushed their teeth twice a day and practiced a healthy oral regimen. All four of them belonged to Group B. These findings clearly indicated a relationship between socioeconomic and oral hygiene status [14].

In a study of attempted suicide in India, 55.5% were uneducated, belonging to low socioeconomic strata. Being illiterate and belonging to female gender increases the risk for suicide [6]. According to studies by Paulander J et al., and Locker D et al., being illiterate and unemployed also increases the chances for poorer oral hygiene [14,15]. Unemployment is a common risk factor for both suicide and maintenance of oral health as poverty and social deprivation denies an access to good medical facilities and increases one's frustration levels [16]. In this study, there were a larger number of participants in Group A (14) compared to Group B (4); this could also be the reasons for poorer oral hygiene levels in Group A. This is in accordance with studies by Al-Sudani FY et al., [16].

Schizophrenia patients are more prone to periodontal diseases [17]. Their oral hygiene levels deteriorate due to intake of anti-psychotic medications which induce xerostomia (Deepa D et al.,) [18]. The participants in Group A in this study were on anti-psychotic medicines like diazepam, sodium valporate and imipramine.

Excessive Consumption of white sugar in any form is an identifiable risk factor not only for initiating dental caries, but also for precipitating poor oral hygiene [19,20]. In this study, 68 out of the 78 participants were found to consume white sugar exceeding five table spoons per day. It is a known fact that any deviation in the mental state of an individual leads to altered eating habits, the consumption of excess sugar and carbohydrate being the commonest of them [21].

Numerous studies have proved that tobacco smoking and tobacco chewing are major risk factors in periodontal disease. Smoking has a multidimensional effect on the prevalence, severity, aetiology, pathogenesis as well as patient's response to both surgical and non-surgical periodontal therapy. Smoking causes major changes in the oral microbiology, immune responses as well as the physiology of the periodontal tissues [1]. In this study, there were 17 male smokers in Group B and 22 male smokers in Group A (those who smoked more than 10 cigarettes/day).

Although numerous studies have been done, correlating oral hygiene and mental illness, no known studies have attempted to draw a relationship between suicidal tendencies and oral hygiene. Suicidal tendencies cannot always be related to mental illness and psychiatric problems [6]. Negative emotions like grief, anxiety, anger and frustration are often associated with impulsive suicides. This is with relevance to a study on oral and dental manifestations of anxiety by Moulton R [22]. Although all the participants in this study were found to brush their teeth once a day, only one participant in Group A changed his tooth brush every six months. A total of 39 participants in Group A used their tooth brush "till it wears out." This reflected their attitude towards oral hygiene maintenance. When a cynical attitude to life sets in; it can also alter one's attitude to tooth brushing and oral hygiene. This is in accordance to a study by Thomas M et al., on cynical hostility and tooth brushing [23].

Keeping the above factors in mind, poorer oral hygiene levels in Group A patients were attributed to multiple confounding factors like:

1. Use of anti-psychotic medications which induces xerostomia according to a study by Deepa D et al., [18],

2. Excessive consumption of white sugar as per similar results by Little JW and Touger-Decker R et al., [19,20],

3. Lower literacy levels and unemployment studies in accordance to studies by Locker D et al., and Al-Sudani et al., [15,16],

4. Habits like smoking and tobacco chewing as per a South West Ethiopian study [7].

Twenty-two participants abruptly left the study. (10 of them in Group A and 12 in Group B), fear of public exposure was the reason cited by most of the Group A participants. Most of the drop outs in Group B did not turn up at the centre thereafter and they refused to communicate with the centre authorities. The volunteers revealed that this was a common pattern observed in many patients who came for counseling. They were referred to as whimsical candidates. Such individuals were shown to possess an unpredictable behaviour which was characteristic of subjects prone to suicide [24].

The subjects in the present study who exhibited poor oral hygiene were associated with multiple risk factors like medicine intake for psychiatric therapy [7], smoking [13], tobacco chewing [13], sugar consumption [19] and lower socioeconomic status [15]. They were also found to be at a greater risk for suicide as they had already attempted it once before [9].

LIMITATION

This was only a pilot study conducted on a limited number of participants. More validating longitudinal studies on a larger patient pool are required to come to more conclusive evidence regarding the association of poor oral hygiene in subjects with suicidal tendencies.

CONCLUSION

It may be inferred from this pilot study that subjects who have actually attempted suicide and are undergoing treatment with medicines have a poorer oral hygiene compared to subjects who have merely threatened to commit suicide. A need for establishing dental health with periodic dental visits were reinforced amongst the subjects during the course of the study. This was to prevent the onset of periodontal complications which can cause a deterioration in oral health later. Further studies which help in recognition of deteriorating oral hygiene in subjects susceptible to suicide are required to be conducted which can serve as a warning sign to physicians in recognition of suicidal symptoms.

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