

DENTAL STATUS AMONG FISHER FOLK COMMUNITIES: A CLINICAL STUDY AND ITS ROLE IN FORENSIC DENTISTRY

ABSTRACT

AIM: To assess the dental findings among fishermen communities residing in the coastal areas of Edakkad and Muzhappilangad, Kannur, Kerala, South India, and the feasibility of using these findings for identification of the subjects in forensic investigation. **MATERIAL AND METHODS:** Fifty males of age group 30-35 years were selected- two groups of 20 each from two fishermen communities and one control group of 10 from the non- fishermen population. The parameters included in the study were work procedure, smoking, tobacco chewing, alcohol consumption, attrition, cervical abrasion, macrodontia, incisal notching, dental caries and facial features. For statistical analysis was used chi-square test. **RESULTS:** All the parameters were significantly more in the study groups compared to the controls. **CONCLUSION:** Further research is suggested to identify other factors which may influence the outcome of forensic investigation.

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KEYWORDS

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INTRODUCTION

Dentistry plays an important role in individual identification procedures during mass disasters in forensic investigation¹. Lack of adequate and cohesive dental information is a major hindrance during these procedures. As dental structures are the hardest and most resilient tissues of the human body², they prove to be one of the most important sources of information.

Scrupulous maintenance of dental records, marking of dentures, identification of variation in the dentition among various communities and making this information available through a worldwide network can go a long way in aiding and hastening the procedures³. It is suggested that, through the FDI World Dental Federation, each member country should appoint dentists, responsible for providing advice and assistance to forensic odontologists in other countries when nationals of the country are victims of an international disaster^{4,5}

The fishermen community worldwide is most exposed to man-made and natural disasters like pirate attacks, hurricanes, cyclones and tsunamis. They are also frequently lost at sea and may land in shores of different countries without any identification papers.

The total number of fishermen population in India is about 8.7 million. In Kerala alone, it is about 0.8 million. This study

was designed to evaluate the dental findings and habits among fisher folk communities and compare them with controls and there by assess the feasibility of such findings for identification in forensic investigation.

MATERIAL AND METHODS

Fifty males of age group 30-35 years were selected. Two study groups of 20 each were taken from two fishermen communities and one control group of 10 from the non-fishermen population. Group 1: from Edakkad, Kannur, Kerala; Group 2: from Muzhappilangad, Kannur, Kerala; Control group: Non-fishermen subjects (from the same areas).

Recording of complete case history, recording of their daily work schedule with an emphasis on oral hygiene, dietary and other habits. Extra and intra oral examination was done and casts were prepared from upper and lower impressions made using alginate impression material. This was followed by photographic documentation of each subject.

Analysis of information obtained from the history regarding their work procedures, dietary habits and oral hygiene habits was done. Analysis for attrition, abrasion, cervico-incisal height and wear facets of the teeth were done using clinical examination findings, cast analysis and photographic studies.

These findings were correlated with the history and a comparison between the study

and the control group was done. All our findings were authenticated by analyzing individual casts.

RESULTS

The following observations were made after correlating the intra oral and extra oral examination findings, photographic analysis and model analysis: 1. Work procedure: About 85% of the study groups are on the sea for 3-4 days a week. Their staple diet is fish which 90% of them consumed along with bones. All of them clean their teeth with fingers and rinse with sea water. Oral hygiene was poor when compared to the controls; 2. Smoking, Tobacco chewing and Alcohol consumption: The habitual consumption of these was significantly higher in the study group when compared to the control; 3. Attrition, Cervical abrasion and Macrodonia: About 80% of attrition was noted in the fishermen population as compared to 10% in the control group. The incidence of cervical abrasion was 30% in group A and 25% in group B. No significant findings were seen in the control group. Both groups revealed about 65% incidence of relative macrodonia as compared with the control group (Figure 1 and 2); 4. Incisal notching, Dental caries and Facial features: About 60% incidence of incisal notching were seen in group A and group B. A very interesting and significant finding was

relatively low incidence of dental caries among the 2 study groups, as compared to high incidence among the controls. Eversion of the angle of the mandible was present in about 60-70% cases in the fishermen groups as compared to the controls (Figure 3).

Statistical analysis was performed using CHI- square test for significance (Table 1, 2 and 3).

DISCUSSION

Physical features may be inherited or acquired. In certain communities peculiar acquired features are noted which serve to differentiate them from the general population. These features may be a result of their occupation and way of life.

In the present study the following acquired characteristics have been analyzed. Bad oral hygiene can be attributed to cleaning teeth with fingers and sea water. The habits related to tobacco and alcohol abuse occur as a response to usage by other colleagues, to relieve stress and in late stages due to physical dependence. The attrition and abrasion can be attributed to tobacco chewing, regular consumption of raw food with bones, usage of sea water mixed with dissolved solids like sand particles.

Incisal notching occurs as a result of weaving of the fishing net holding the nylon fibre between the teeth. Low incidence of dental caries may be attributed to high intake

of fibrous, raw food and high salinity of sea water. Eversion of mandibular angle is due to masseteric hypertrophy caused by constant and severe clenching of jaws during rowing, throwing the nets and while pulling the catch.

In the absence of dental records, knowledge of peculiar characteristics of a community can thus aid in forensic investigations.

Table 1. Role of habits.

Group		Value	df	Asymp.sig. (2-sided)
Beedi and Smoking	Pearson Chi-Square	19.063	2	0.000
	Likelihood Ratio	20.144	2	0.000
	Linear-by-Linear Association	10.114	1	0.001
Tobacco and Betel Nut Chewing	N of valid cases	60		
	Pearson Chi-Square	29.048	2	0.000
	Likelihood Ratio	29.866	2	0.000
Alcohol consumption	Linear-by-Linear Association	19.784	1	0.000
	N of valid cases	60		
	Pearson Chi-Square	7.600	2	0.022
	Likelihood Ratio	7.866	2	0.020
	Linear-by-Linear Association	4.818	1	0.028
	N of valid cases	60		

0 cells (.0%) have expected count less than 5. The minimum expected count is 8.33; 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.00; 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.00.

These findings serve to identify victims of natural calamities and disasters on the sea. It is possible to distinguish people of fishermen communities from others. As an example, in a situation where native citizens are detained in foreign lands and are suspected as spies, features from our study could be a useful tool for their genuine identification. Terrorists can be discriminated from native fishermen based on the same grounds. However the necessity of maintaining dental records cannot be over

emphasized. The wear facets, attrition and abrasion being unique for an individual, maintaining such records will help us in establishing the identity of the individual⁶.

It has been found that even identical twins do not have identical dentition⁷. Thus accurate and complete dental records alone can increase the likelihood of positive identification. Proper examination, handling and evaluation of dental evidence are necessary which could then be presented in

the interest of justice. Our findings by themselves do not aid in identification of the individual; but when combined with other

dental and circumstantial evidence, can assist in the same^{6,8}.

Table 2. Showing clinical changes general attrition , Cervical abrasion, relative macrodontia.

Group		Value	df	Asymp.sig. (2-sided)
Generalized Attrition	Pearson Chi-Square	26.606	2	0.000
	Likelihood Ratio	29.072	2	0.000
	Linear-by-Linear Association	19.622	1	0.000
Cervical Abrasion	N of valid cases	60		
	Pearson Chi-Square	6.902	2	0.032
	Likelihood Ratio	10.241	2	0.006
Relative Macrodonia	Linear-by-Linear Association	4.105	1	0.043
	N of valid cases	60		
	Pearson Chi-Square	22.941	2	0.000
Relative Macrodonia	Likelihood Ratio	30.312	2	0.000
	Linear-by-Linear Association	16.919	1	0.000
	N of valid cases	60		

0 cells (.0%) have expected count less than 5. The minimum expected count is 8.67; 0 cells (.0%) have expected count less than 5. The minimum expected count is 3.67; 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.67.

Table 3. Showing changes in incisal notching , Dental Caries and ever.

Group		value	df	Asymp.sig. (2-sided)
Incisal Notching	Pearson Chi-Square	18.754	2	0.000
	Likelihood Ratio	25.435	2	0.000
	Linear-by-Linear Association	12.583	1	0.000
Dental Caries	N of valid cases	60		
	Pearson Chi-Square	12.443	2	0.002
	Likelihood Ratio	12.153	2	0.002
Eversion of Angle of Mandible	Linear-by-Linear Association	10.183	1	0.001
	N of valid cases	60		
	Pearson Chi-Square	23.348	2	0.000
Eversion of Angle of Mandible	Likelihood Ratio	30.753	2	0.000
	Linear-by-Linear Association	19.622	1	0.000
	N of valid cases	60		

0 cells (.0%) have expected count less than 5. The minimum expected count is 7.67; 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.33; 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.67.

Figure 1: Shows cervical abrasion.



Figure 2: Shows Macrodonia.



Figure 3: Shows Incisal notching.



Dental identification is essentially of two forms; the first is comparative identification where the dead individuals teeth are compared with his or hers dental records. Here some clue about the possible identity of the deceased is required. The second known as reconstructive identification or dental profiling is used when no clue is available regarding the identity of the subject. Here an attempt is made

to ascertain the population affinity or race, sex, age and occupation of the dead individual⁹.

CONCLUSION

Further research is suggested in order to explore and identify the prevailing factors and circumstantial evidences which may influence the outcome of forensic investigation.

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