

THE KNOWLEDGE, ROLE AND APPLICATION OF EXFOLIATIVE CYTOLOGY IN THE DIAGNOSIS OF ORAL MUCOSA PATHOLOGY –A QUESTIONNAIRE BASED STUDY

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Abstract

The screening and the early detection of the lesions are the only means for controlling the disease. General dental practitioners can play a great role in this direction. The objective of the present study was to assess the self-reported knowledge, as well as the application of exfoliative cytology in the diagnosis of oral mucosa pathology. About 150 clinicians were randomly selected, who answered a questionnaire regarding demographic data and data relating to exfoliative cytology (EC). Results showed that more than 80% of individuals who worked with the diagnosis of oral lesions and surgery reported knowing what EC is. The professionals without post graduate degrees gave a greater number of appropriate answers than professionals with post graduate educations. Although 72% of the dentists adequately identified the pathologies for which EC is recommended, it was concluded that the respondents had poor knowledge of EC. There is a need to increase dentists' awareness of this subject and of EC's use in diagnostic practices.

Keywords- Exfoliative cytology, Oral mucosal pathology, Questionnaire, Dentist

Introduction

Oral cavity reflects the various events occurring in the body and this is reflected by cytomorphological and nucleomorphological variations in the exfoliated cells. Exfoliative cytology is based on the monitoring the exfoliated cells or cells flake off the mucosa whether through natural or artificial means. ^[1] Oral cytology examination in oral mucosa is uncommon as a routine diagnostic tool.

Exfoliative cytology as a diagnostic tool is most popular in gynecology. Since cervix cytology (the Papanicolou technique) appeared in the 1940's in diagnostics, the number of deaths from cervical cancer has decreased. Unfortunately, the role of exfoliative cytology in screening for oral cancer still isn't as successful as it is in the diagnostic process of the uterine cervix cancer. ^[2]

Though it is not a foolproof method, exfoliative cytology (EC) remains one of the simple and non invasive methods for detecting dysplasia in the suspicious and the innocuous looking lesions in the Indian setup. Oral cancer still has high levels of incidence and mortality, where most cases are diagnosed at later stages of the disease. ^[3]

However, many dentists have shown a lack of interest in or a lack of knowledge of this topic, and there is a need for interventions in professional education. The purpose of this survey was to assess the dentists' knowledge as well as their practices concerning the role and application of exfoliative cytology in the diagnosis of oral mucosa pathology.

Material and methods

The present study was a cross-sectional questionnaire survey which was conducted among 150 randomly selected clinicians of Varanasi, India. Self-administered questionnaires were personally handed out to the practicing dentists. In addition, a letter assured the dentists anonymity and confidentiality of all the responses. The completed questionnaires were collected back immediately. The informed consents of the participants were obtained.

The questionnaire [Figure-1] was divided into two parts: the first part referred to the professional's profile, and the second part referred to his or her knowledge about EC.

Statistical analysis was performed using SPSS for Windows release 16.0 (SPSS Inc., Chicago, IL, USA). Frequency distributions were obtained and mean values for continuous variables (\pm value of standard deviation) were calculated. Chi-square test and t-test were used to compare differences between groups. Statistical significance was set at $p < 0.05$.

Results

Among the 150 respondents, there was a majority of men (66 %), and the mean age was 30.08 ± 3.45 years. The mean time in dental practice was 3.32 ± 1.67 years.

Regarding education level, the answers were grouped into two categories: undergraduates and postgraduates. Our study comprised of 73 undergraduates and 77 postgraduates. Postgraduates were grouped under seven specialties. (Table 1)

When asked regarding the thorough examination of oral cavity only 10% undergraduate and 19% postgraduates gave affirmative answer, which came out to be statistically significant (p value < 0.05). These individuals when asked regarding whether they rely on visual examination only, 12% agreed they do not rely on visual examination alone and out of these 1.3% performed exfoliative cytology and remaining 10.7% agreed with biopsy.

0.7% undergraduates and 3.3% postgraduates agreed that exfoliative cytology is suitable for clinical set up. And the results turned out to be statistically insignificant. (Table 2)

6.7% of the postgraduates and 0.7% of undergraduates had prior experience of performing exfoliative cytology. The results were statistically significant. The same data was obtained regarding the training for performing exfoliative cytology. (Table 2)

46.7% undergraduates and 53.3% postgraduates haven't attended any educational programs earlier and hence felt the need for additional educational programmes. Only 4.7% undergraduates and 9.3% postgraduates have referred the suspicious lesions to higher centre. The results were statistically significant. (Table 2)

Only 2.7% undergraduates and 6.7% postgraduates had previously taken help of oral pathology consultant in early detection of oral mucosal changes. The results turned out to be statistically insignificant. (Table 2)

Knowledge of EC

When asked about the need for mouth rinse, 8.7% undergraduates and 6.7% postgraduates gave positive answer. Among the participants who reported the need for a mouth rinse, the products listed were saline (6.7%, n = 10), Chlorhexidine (5.3%, n = 8), water (3.3%, n = 5).

Answers regarding the sampling instrument, the fixative and the pathologies that can be diagnosed using EC were classified as appropriate or inappropriate. The percentages of appropriate answers and inappropriate/no answers are reported relative to the total number of answers and not to the number of respondents who answered this part of the questionnaire.

Appropriate answers regarding the sampling instruments were spatulas, plastic, metal or wood spatulas and brushes, and inappropriate answers included cotton swabs, blades and scalpels, among others. Majority of participants 72% selected brushes as sampling instrument followed by wooden spatulas selected by 71.3%.(Table 3)

Regarding the fixative, the answers were also grouped into appropriate (ethanol and ethanol/ether) and inappropriate (formaldehyde and distilled water, among others). Formaldehyde was selected as the fixative of choice by 74 % of the sample. (Table 4) Regarding the pathologies for which EC might be indicated, appropriate answers (carcinomas, paracoccidioidomycosis, Pemphigus, Candidiasis, herpes, actinomycosis or ulcerations), while the remainder consisted of inappropriate answers (Fibroma, Mucocele, Periodontitis, caries, all of the options mentioned and any unidentified lesion). (Table 5)

The answer 'leukoplakia' was excluded from the analysis due to controversy regarding the use of EC for the diagnosis of leukoplakia. The most frequent answers were oral cancer (72% of the sample), leukoplakia (80 % of the sample) and candidiasis (74% of the sample).

Table 1 Percentage of the sample and numbers of individuals who reported knowledge of EC in each field of practice.

QUALIFICATION	Total no.of participants	Percentage of the sample
UNDERGRADUATES	73	48.7%
POSTGRADUATES		
ENDODONTICS	10	6.7%
ORTHODONTICS	08	5.3%
PERIODONTICS	11	7.3%
ORAL SURGERY	18	12%
PROSTHODONTICS	10	6.7%
ORAL MEDICINE AND RADIOLOGY	12	8%
PEDODONTICS	08	5.3%

Table 2- Percentage of the sample regarding variables showing attitude and awareness of clinicians

QUALIFICATION	Q 11		Q12		Q13		Q1	Q1	Q16		Q17	
	YES %	NO %	YES %	NO %	YES %	NO %	4%	5%	YES %	NO %	YES %	NO %
UNDERGRADUATES	0.7	48.0	0.7	48.0	0.7	48.0	48.7	48.7	5.3	43.3	2.7	46.0
POSTGRADUATES												
ENDODONTICS	0.0	6.7	0.7	6.0	0.7	6.0	6.7	6.7	0.0	6.7	0.0	6.7
ORTHODONTICS	0.0	5.3	0.7	4.7	0.7	4.7	5.3	5.3	0.0	5.3	0.7	4.7
PERIODONTICS	1.3	6.0	0.0	7.3	0.0	7.3	7.3	7.3	0.7	6.7	2.0	5.3
ORAL SURGERY	0.7	11.3	0.0	12.0	0.0	12.0	12.0	12.0	4.7	7.3	2.0	10.0
PROSTHODONTICS	0.7	6.0	0.7	6.0	0.7	6.0	6.7	6.7	0.7	6.0	0.7	6.0
ORAL MEDICINE AND RADIOLOGY	0.7	7.3	4.7	3.3	4.7	3.3	8.0	8.0	2.7	5.3	0.7	7.3
PEDODONTICS	0.0	5.3	0.0	5.3	0.0	5.3	5.3	5.3	0.0	5.3	0.7	4.7
P ≤ 0.05 , (statistically significant)	.200		0.000		0.000				.011		0.346	

Table 3- Percentage of the sample regarding variables showing knowledge about the product used to collect sample

	Total % of practitioners
Plastic Spatulas	68.0
Metal Spatulas	68.7
Wooden Spatulas	71.3
Brushes	72
Cotton Swabs	61.3
Blades	54.7
Scalpels	60

Table 4- Percentage of the sample regarding variables showing knowledge about the fixative used

	Total % of practitioners
Ethanol	14.7
Ether	2.7
Formaldehyde	74.0
Distilled water	15.3

Table 5- Percentage of the sample regarding variables showing knowledge about the Lesions for which Exfoliative cytology is indicated

	Total % of practitioners
Carcinoma	72
Paracoccidioidomycosis	7.3
Pemphigus	11.3
Candidiasis	74
Herpes	72.7
Actinomycosis	6.7
Ulcerations	25.3
Fibroma	34.7
Mucocele	35.3
Periodontitis	20.7
Caries	0
Leukoplakia	80

Discussion

The method is well tolerated by patients and is less stressful when compared to biopsy, so it can be widely used in population screening programs. Any dentist could perform an oral brushing and, up to now, no contradictions are known. The results greatly concern us, as many of the dentists themselves showed significant gaps in their knowledge with respect to the diagnostic procedures, with only few (1.3 %) performing an exfoliative cytology in their clinical practice and most of them thinking that it was unsuitable in a clinical set up. Only 4% consider it to be suitable for clinical set up.

The high percentage of inappropriate answers to questions about the need for a mouth rinse, the sampling instrument, the fixative and the indicated pathologies could indicate a lack of knowledge about the subject in the portion of the population that reported knowing what EC is.

The need for a mouth rinse prior to the application of EC is a controversial subject. While some authors have used a mouth rinse to remove food debris and mucin,^[4,5,6] others have not reported using this procedure.^[7,8,9] The purpose of using a mouth rinse is to remove food debris and mucus, and this removal can be achieved with the use of saline or water. Mouthwashes can alter test results even 1 hour after use.^[10]

A cytobrush, wooden spatula, metal spatula and cotton swab, among others, are the instruments that have been cited in the literature for EC material collection.^[4,11-14] The answer “cotton swab” was considered to be an inappropriate answer because few epithelial cells can be collected with this instrument, possibly due to its non-adhesive surface.^[14] The most cited instrument was the wooden spatula; however, using a wooden spatula can result in inadequate material being collected because the wood can absorb part of the sample, thereby reducing the quality of the smear. Some authors have recommended moistening the wooden spatula to prevent dehydration of the site to be sampled.^[12] The use of the cytobrush provides more even distribution of cells on the glass slide as compared to the wooden spatula,^[14] resulting in a smear with better homogeneity and cellularity than with a metal spatula.^[13]

Formaldehyde was indicated by majority of the sample as the fixative of choice for EC, which suggests that many dentists could be confusing EC with biopsy. Some individuals answered that EC is indicated for the diagnosis of leukoplakia, while others did not. As has been indicated in the literature, this subject is controversial, and we could not classify this answer as appropriate or inappropriate. Therefore, we decided to exclude that option from our analysis.

Regarding the assertion of knowledge of EC, a significant difference was found between individuals who obtained post graduation in Oral Medicine and Oral Surgery. This difference might have been due to a more in-depth discussion of topics related to pathology and diagnosis in surgery programs. Our results showed that more than 80% of individuals who worked with the diagnosis of oral lesions and surgery reported knowing what EC is. When making comparisons between different education levels with

regard to the professionals who gave appropriate answers, there was only a statistical significance regarding the fixative. The professionals without post graduate degrees gave a greater number of appropriate answers than professionals with post graduate educations, which might have been related to the tendency of specialists to focus on their own specialties and to have less interest in others.

In summary, in view of the findings of this study, improving the level of the knowledge and the usage of exfoliative cytology by a population of dentists becomes a very important public health and preventive strategy, along with patient counseling for the reduction of the burden of the disease. Because such an improvement can be gradually achieved, an increased awareness on the role of the oral pathologists as consultants in the clinical practice needs to be emphasized. This is a pilot study which was conducted on a convenient group of dentists; hence, a further survey on a larger scale is necessary to assess and implement any measures.

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