ECRONICON OPEN ACCESS

EC MICROBIOLOGY
Review Article

Recent Techniques for Diagnosis of Oral Squamous Cell Carcinoma

Jawed Ahmed Badvi[1]*, Kulsoom Jawed[2], Ikram Uddin Ujjan[3], Bushra Parveen[4] and Maria Jawed Badvi[4]

[1]*Professor Pathology, Ghulam Muhammad Mehar medical College Sukkur, Pakistan*

[2]*Senior Lecture, Dow International Medical College, Karachi, Pakistan*

[3]*Professor Pathology, Liaquat University of Health Science Jamshoro, Pakistan*

[4]*Combined Military Hospital Hyderabad, Lecture, Dow Dental College Karachi, Pakistan*

***Corresponding Author**: Jawed Ahmed Badvi, Professor Pathology, Ghulam Muhammad Mehar medical College Sukkur, Pakistan.

Received: January 09, 2107; **Published:** January 27, 2017

Abstract

Background: Oral squamous cell carcinoma comprises 90% of oral malignancies. The 5-suvival rate for OSCC is still very low despite recent advance which paves way for further researches to find efficient diagnostic tools.

Objective: To review literature for recent techniques for diagnosis of oral squamous cell carcinoma

Methodology: A web based research was conducted using Pub Med. The inclusion criteria were publications published in English with in recent years. Key words like "Oral squamous cell carcinoma", "Oral cavity" "Diagnostic techniques" were used to search for articles. Studies in other languages and case reports were excluded.

Conclusion: Histopathological examination on biopsy tissue remains the gold standard for diagnosis. However, other methods of diagnosis are technique sensitive and further exhaustive research is required.

Keywords: *Oral squamous cell carcinoma; Oral cavity; Diagnostic techniques*

Introduction

Oral squamous cell carcinoma comprises 90% of all oral malignancies [1-3]. The incidence of Oral squamous cell carcinoma is expected to rise in coming decades as feared by the World Health Organization [4]. Despite aggressive treatment modalities OSCC still remain a disease with high mortality rate and lowest 5- year survival rate therefore this directs us towards search for efficient, effective and more sophisticated diagnostic tools to promptly address this fatal disease which may help the patient to suffer less trauma through surgeries, save time and money, increase survival rate with better quality of life [5].

The risk factors most frequently found associated with OSCC are alcohol and tobacco smoking [1,6,7]. Other risk factors as sunlight exposure, low socio-economic status, HPV infection, diet are well known risk factors as well [7].

Method

A web based search was conducted for research articles published in Pub Med/Medline, articles other than English language and case reports were excluded, however, review articles and original articles published in recent years were included in this study. Search was made using key words like, "Oral squamous cell carcinoma", "Oral cavity", "Diagnostic techniques".

Review of the Literature

History of the patient and Clinical Examination

Many studies reported no association between influence of gender and treatment outcomes. Therefore nor age neither gender has strong impact on prognosis [5].

Several studies found significant association between low socio economic status and lack with awareness with limited access to health care services and poor oral hygiene [8].

A vast majority of authors recognized tobacco and alcohol as potential risk factors for OSCC and report increased mortality rate in tobacco users and alcohol drinkers [6].

Thorough clinical examination and palpation of lymph nodes help decide the customized diagnostic tool for each patient [9,10].

Vital Staining

Toluidine Blue is frequently used for vital tissue staining for OSCC. It is an inexpensive and rapid diagnostic tool. Epstein., *et al.* [11] showed Toluidine blue to have specificity and sensitivity of 63.2% and 92.5%. Methylene Blue is less toxic and cheaper than toluidine blue. Rose Bengal is by far reported as valuable diagnostic stain [12]. However, extensive studies to establish the fact are needed.

Histopathology

Gold standard for detection of OSCC remains histology as reported by Lane., *et al*. with specificity and sensitivity of 100% & 98% respectively [13]. Either incisional or excisional biopsy is carried out the biopsy specimen is categorized on basis of severity of dysplasia into mild, moderate and severe according as described by the World Health Organization.

However, on excisional biopsy it is imperative to be sure that depth and margins are composed of normal (disease free) tissue [14].

Photo Spectrometry: On basis of principle of light reflectance and absorbance by abnormal tissues the light based devices work [15]. However, further investigations on large scale are needed.

Cytology

Oral Cytological studies mainly comprise use of methods such as, Fine Needle Aspiration Cytology, Exfoliative cytology and Liquid-based cytology. For High-risk groups for malignancy, cytology has proven to be efficient diagnostic tool with advantages of being inexpensive, fast, comparatively less traumatic, painless and easy in handling [16].

However, use of cytological studies for low risk groups still need further research to establish it as an efficient diagnostic method, Patton., *et al* [16].

Molecular Analyses

Cytogenetic analysis shows mutations in chromosome 9, 17, 3P, 13q21 & 18q21 [17]. Other frequently studied and mutated genes are p53, p14ARF, p73, MYC, SMAD3, TGFBR2 & Cyclin D1 [17].

AgNOR analysis for number of keratinized cells and nucleolar activity on oral cytology must be included in routine to diagnose OSCC as reported by Remmerbach., *et al*. [18].

Tumor markers such as MCM (Mini chromosome maintenance), survivin, BURB1, Heat Shock Proteins, CD44 are promising diagnostic tools in near future [2,17]. However, Ki-67 and p53 are found to be most commonly applied bio makers in detection and prognosis of OSCC [19-25].

Conclusion

Histopathological technique is so far taken as gold standard, since other techniques still require extensive researches to be recognized as reliable and effective diagnostic modalities which can help reduce the trauma, prove to be cost effective and help decide the customized treatment planning for each patient. The current status in Pakistan regarding diagnosis of OSCC is still unsatisfactory. Further researches are immensely required to better help patient at early stages of disease so that survival rate of patient may increase.

Bibliography

1. Li YF., *et al*. "DNA methylation profiles and biomarkers of oral squamous cell carcinoma". *Epigenetics* 10.3 (2015): 229-236.

2. J Chen., *et al*. "Significance of CD44 expression in head and neck cancer: a systemic review and meta-analysis". *BMC Cancer* 14 (2014): 15.

3. Beenken SW and Urist MM. "Head and neck tumors". In: Way LW, Doherty GM, editors. Current surgical diagnosis and treatment, 11th ed. New York: Lange Medical Books/McGraw-Hill (2003): 282-297.

4. "The World Oral Health Report 2003". *Geneva: World Health Organization* (2003): 6-7.

5. Lo W-L., *et al*. "Outcomes of oral squamous cell carcinoma in Taiwan after surgical theraphy: factors affecting survival". *Journal of Oral and Maxillofacial Surgery* 61.7 (2003): 751-758.

6. Zygogianni., *et al*. "Oral squamous cell cancer: early detection and the role of alcohol and smoking". *Head and Neck Oncology* 3 (2011): 2.

7. Friemel., *et al*. "Pretreatment oral hygiene habits and survival of head and neck squamous cell carcinoma (HNSCC) patients". *BMC Oral Health* 16 (2016): 33.

8. Leite ICG and Koifman S. "Survival analysis in a sample of oral cancer patients as a reference hospital in Rio de Janerio, Brazil". *Oral Oncology* 34.5 (1998): 347-352.

9. Ferlito A., *et al*. "Changing concepts in the surgical management of the cervical node metastasis". *Oral Oncology* 39.5 (2003): 429-435.

10. Woolgar JA., *et al*. "Cervical lymph node metastasis in oral cancer: the importance of even microscopic extracapsular spread". *Oral Oncology* 39.2 (2003): 130-137.

11. Epstein JB., *et al*. "Toludiene blue and lugol's iodine application in the assessment of oral malignant diseases and lesions at risk of malignancy". *Journal of Oral Pathology and Medicine* 21.4 (1992): 160-163.

12. Du GF., *et al*. "Rose Bengal staining in detection of oral precancerous and malignant lesions with colorimetric evaluation: a pilot study". *International Journal of Cancer* 120.9 (2007): 1958-1963.

13. Lane PM., *et al*. "Simple device for the direct visualization of oral-cavity tissue florescence". *Journal of Biomedical Optics* 11.2 (2006): 024006.

14. Cercadillo-Ibarguren I., *et al*. "Histologic evaluation of thermal damage produced on soft tissues by $CO_{2,}$ Er, Cr:YSGG and diode lasers". *Medicina Oral Patologia Oral y Cirugia Bucal* 15.6 (2010): e912-e918.

15. Rethman MP., *et al*. "Evidence-based clinical recommendations regarding screening for oral squamous cell carcinomas". *Journal of the American Dental Association* 141.5 (2010): 509-520.

16. Patton LL., *et al*. "Adjunctive techniques for oral cancer examination and lesion diagnosis: a systematic review of the literature". *Journal of the American Dental Association* 139.7 (2008): 896-905.

17. Taghavi N and Yazdi I. "Prognostic factors of survival rate in oral squamous cell carcinoma: Clinical, histologic, genetic and molecular concepts". *Archive of Iranian Medicine* 18.5 (2015): f314-f319.

18. Remmerbach TW., *et al*. "Diagnostic value of nucelolar organizer regions (AgNORs) in brush biopsies of suspicious lesions of oral cavity". *Analytical Cellular Pathology* 25.3 (2003): 139-146.

19. Lee., *et al*. "Positive expression of NANOG, mutant p53 and CD44 is directly associated with clinicopathological features and poor prognosis of oral squamous cell carcinoma". *BMC Oral Health* 15.1 (2015): 153.

20. Li Y and Zhang J. "Expression of mutant p53 in oral squamous cell carcinoma is correlated with the effectiveness of intra-arterial chemotheraphy". *Oncology Letters* 10.5 (2015): 2883-2887.

21. Pereira CH., *et al*. "Expression of adhesion proteins (E-cadherin and β-catenin) and cell proliferation (Ki-67) at the invasive tumor front in conventional oral squamous cell and basaloid squamous cell carcinomas". *Archives of Oral Biology* 61 (2016): 8-15.

22. Tandon S., *et al*. "A systematic review of p53 as prognostic factor of survival in squamous cell carcinoma of the four main anatomical subsites of the head and neck". *Cancer Epidemiology, Biomarkers and Prevention* 19.2 (2010): 574-587.

23. Matsuhira A., *et al*. "Cytokeratin 13, Cytokeratin 17, Ki-67 and p53 expression in upper layers of epithelial dysplasia surrounding tongue squamous cell carcinoma". *Bulletin of Tokyo Dental College* 56.4 (2015): 223-231.

24. Rivera C and Venegas B. "Histological and molecular aspects of oral squamous cell carcinoma (Review)". *Oncology Letters* 8.1 (2014): 7-11.

25. Khyani MAI., *et al*. "Recent advances in diagnosis of oral pre-malignant and malignant lesions- A review". *Pakistan Journal of Otolaryngology* 29 (2013): 54-58.

Volume 5 Issue 5 January 2017