International Journal of Advanced Biotechnology and Research (IJBR)
ISSN 0976-2612, Online ISSN 2278–599X,
Vol-8, Issue-4, 2017, pp2067-2071
http://www.bipublication.com

Research Article

Analysis of novel technologies to detect or manage oropharyngeal carcinoma

Mohammad Ahmad Shahbaz [1], Ramsha Jalal[2]

and Muhammad Talha Shabbir[3]

[1]Dental Surgeon at DHQ Hospital, Khanewal, Pakistan
[2]Dental Surgeon at DHQ Hospital, Lodhran, Pakistan
[3]Dental Surgeon at RHC MeeranMallah, Jalalpurpeerwala, Multan

ABSTRACT

Background of the study: Oropharyngeal cancers include cancers of the base of the tongue, tonsil, soft palate, and posterior pharyngeal wall. Many oropharyngeal cancers are difficult to see, even when using a tongue blade and light source.

Aim of the study: The basic aim of the study is to find the novel biomarkers which are used to identify the oral cancer before and after treatment of radiotherapy.

Methodology of the study: The data was collected from DHQ Hospital, Khanewal and DHQ Hospital, Lodhran during the time period of Aug 2017 to Oct 2017. Those oral cancer patients who receiving radiotherapy were selected to study the Sialic Acid status in the diseased condition.5.0 ml saliva sample was taken for the analysis. Saliva was further processed for the estimation of Sialic Acid. Commercially available enzymatic kits of Randox were used.

Results: According to our data levels of sialic acid become increases in tongue cancer patients receiving radiotherapy. The levels of sialic acid become highly decreases in oral cancer after radiotherapy.

Conclusion: Therfore sialic acid is considerd to be as a dignostic tool in case of tongue cancer patients who recived radiotherapy.

Keywords: Oral, cancer, treatment, orophyrangeal

INTRODUCTION

The terms ‘oral and oropharyngeal cancer include a diverse group of tumors arising from the head and neck, including cancers of the buccal mucosa, hard and soft palate, tongue, and cancers of the oropharyngeal sub-sites such as tonsils, posterior pharyngeal wall and tongue base[1]. These tumors as of now speak to the 6th most normal disease around the world. In Ireland, a normal of 349 instances of oral or oropharyngeal squamous cell carcinoma were enlisted yearly in the vicinity of 2010 and 2013[2]. The five-year survival rate for these patients was accounted for to be 55% out of 2011. Moreover, an investigation of oral and oropharyngeal growths in Ireland recognized that the analysis and treatment of cutting edge oral and oropharyngeal tumor is putting a gigantic weight on an as of now overburdened social insurance framework. In the vicinity of 2003 and 2011, 37% of patients were determined to have arrange IV sickness, contrasted with 27% determined to have organize IV illness between 1994 to 2002[3].

At the minuscule level, the injuries demonstrate fluctuating degrees of epithelial dysplasia, from gentle to extreme[4]. Long haul thinks about have demonstrated that the general danger of harmful change of all evaluations of epithelial dysplasia has been accounted for to be around 16%. Nonetheless, it must be noticed that not all instances of genuine squamous cell carcinoma give these pre-threatening changes[5]. Likewise,

without these unmistakable morphological changes, white light endoscopy has restricted use for pre-dangerous injuries inferable from their level appearance. Provoke careful extraction of these premalignant sores could anticipate movement to SCC[6]. This speaks to the single most prominent determinant of long haul understanding survival and successful treatment. In this way, obviously a novel, non-intrusive strategy for distinguishing the consecutive hereditary adjustments at the most punctual conceivable time purpose of ailment improvement is justified[7].

BACKGROUND OF THE STUDY

Oral health issues are very common now a days and these problems are going to be increase due to several factors. Smoking and bad eating habits are also one of the main cause of oral cancers. Oral cancer most often refers to squamous cell carcinoma of the oral cavity (the anatomic region that extends from the lip to the junction of the hard and soft palate superiorly and the vallate papillae of the tongue inferiorly). Oropharyngeal cancers include cancers of the base of the tongue, tonsil, soft palate, and posterior pharyngeal wall. Many oropharyngeal cancers are difficult to see, even when using a tongue blade and light source[8].

Aim of the study

The basic aim of the study is to find the novel biomarkers which are used to identify the oral cancer before and after treatment of radiotherapy.

METHODOLOGY OF THE STUDY

The data was collected from DHQ Hospital, Khanewal and DHQ Hospital, Lodhran during the time period of Aug 2017 to Oct 2017. Those oral cancer patients who receiving radiotherapy were selected to study the Sialic Acid status in the diseased condition.5.0 ml saliva sample was taken for the analysis. Saliva was further processed for the estimation of Sialic Acid. Commercially available enzymatic kits of Randox were used. In this study we excluded the patients with associated illness like Myocardial Infarction, Hypertension, Renal, Hepatic, Pancreatic and Pulmonary diseases were excluded from the study.Student's t-test was performed to evaluate the differences in roughness between group P and S. Two-way ANOVA was performed to study the contributions. A chi-square test was used to examine the difference in the distribution of the fracture modes (SPSS 19.0 for Windows, SPSS Inc., USA).

RESULTS

Table 01: Hb levels of oral cancer patients with the comparison of control group

Oral cancer patients	CONTROL	Hb(gm/dl)			
		MALES (n=04)		FEMALES (n=00)	
	12-16gm/dl	BEFORE	AFTER	BEFORE	AFTER
R1	0.00	8.90±0.00	7.99±0.00	0.00±0.00	0.00±0.00
R2	0.00	8.08±0.52	7.30±0.79	0.00±0.00	0.00±0.00
R1+C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
R2+C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
Total	0.00	8.29±0.58	7.47±0.73	0.00±0.00	0.00±0.00

R1=Received Radio Therapy Single Time
R2=Received Radio Therapy Two Times
R1+C=Received Radio Therapy Single Time + Chemotherapy
R2=Received Radio Therapy Two Times + Chemotherapy
C=Only Received Chemotherapy

The data explaining in the above table shows that levels of haemoglobin become decreases in tongue cancer patients who received radiotherapy. The mean value of Hb is decreases from 8.29±0.58 to 7.47±0.73.

Table 02: Levels of sialic Acid in saliva of oral cancer patients

Oral Cancer	CONTROL	SIA (µg/dl)			
		MALES (n=04)		FEMALES (n=00)	
	0.37	BEFORE	AFTER	BEFORE	AFTER
R1	0.00	1.24±0.00	0.09±0.00	0.00±0.00	0.00±0.00
R2	0.00	1.04±0.75	0.12±0.06	0.00±0.00	0.00±0.00
R1+C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
R2+C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
C	0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
Total	0.37	1.09±0.62	0.11±0.05	0.00±0.00	0.00±0.00

Means±SD

According to our data levels of sialic acid become increases in tongue cancer patients receiving radiotherapy. The levels of sialic acid become highly decreases in tounge cancer after radiotherapy. Therfore sialic acid is considerd to be as a dignostic tool in case of tongue cancer patients who recived radiotherapy. Figure 01 explains the specificity and sensitivity curve of sialic acid levels in saliva.

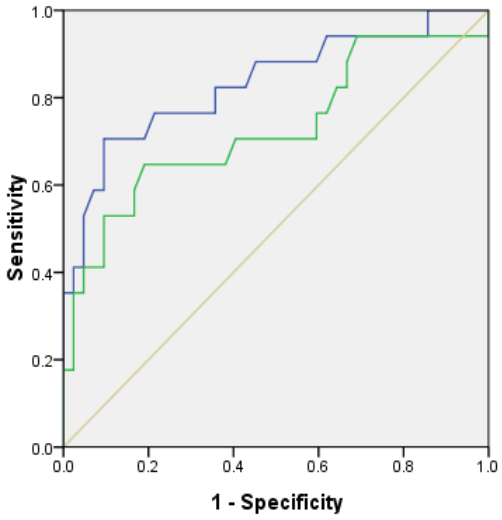

Figure 01: ROC curve of sensitivity and specificity o Sialic Acid in saliva

DISCUSSION

Cancer is fundamentally an occasion start from gene level and finally leads to the DNA damage. Numerous factors play important role in carcinogenesis such as chemicals, viruses, irradiation and genetic composition of an individual[9]. Whereas, ROS and RNS are two important factors which leads to DNA damage. The extent of DNA damage depends not only on ROS/RNS levels but also on the body's resistance mechanisms alongside a variety of cellular antioxidants[10].

The oral cavity and oropharynx are important areas that should be carefully inspected and palpated, particularly in tobacco and alcohol users, to evaluate for oral and oropharyngeal cancer[11]. A red or white patch or a change in color, texture, size, contour, mobility, or function of intraoral, perioral, or extraoral tissue should arouse suspicion of the presence of malignant or premalignant lesions in these regions. Comprehensive head and neck examinations should be part of all medical and dental examinations[12]. Primary care physicians are well suited to providing head and neck examinations

and to screening for the presence of suspicious lesions. Referral for biopsy and further diagnosis might be indicated, depending on the experience of examining physicians. In the future, examination and screening for oral and oropharyngeal cancers will likely include novel technologies aimed at detecting molecular markers of premalignant and malignant changes[13]. In a similar study, the activities of GSH-Px and SOD and the levels of copper, zinc, and malondialdehyde were determined and compared with healthy subjects acting as controls. The MDA levels were higher and the antioxidant activity and Zn levels lower in the prostate cancer groups than in the healthy control[14]. These results confirm the value of therapies aimed at increasing the antioxidant capacity and encourage the use of plasma and erythrocyte Zn levels in the differential diagnosis of BPO (Benign prostatic obstruction) and prostate cancer[15]. Our results lend credibility to these observations. Thus, in the present study we have demonstrated the status of sialic acid and antioxidants in plasma of oral cancer patients become decreases in comparison with normal subjects. Thus, we feel that the overproduction of free radicals by the inflammatory processes of oral cancer causes potential oxidative injury and damage antioxidant defense system in cancer patients[16].

CONCLUSION

It is concluded that sialic acid plays an important role in the detection and management of oral cancers.

Contribution of authors

All the authors contributed equally.

REFERENCES

1. Macfarlane GJ, Boyle P, Evstifeeva TV, Robertson C, Scully C. Rising trends of oral cancer mortality among males worldwide: the return of an old public health problem. Cancer Causes Control. 1994;5(3):259–65.
2. Ries LAG, Kosary CL, Hankey BF, Miller BA, Clegg L, Edwards BK, editors. SEER cancer statistics review, 1973–1996. Bethesda, MD: National Cancer Institute; 1999.
3. Downer MC. Patterns of disease and treatment and their implications for dental health services research. Community Dent Health. 1993;10(Suppl 2):39–46. [
4. National Cancer Institute. Surveillance, Epidemiology, and End Results program public-use data, 1973–1998. Rockville, MD: National Cancer Institute, Division of Cancer Control and Population Sciences, Surveillance Research Program, Cancer Statistics Branch; 2001.
5. Schantz SP, Spitz MR, Hsu TC. Mutagen sensitivity in patients with head and neck cancers: a biologic marker for risk of multiple primary malignancies. J Natl Cancer Inst. 1990;82(22):1773–5.
6. Regezi JA, Dekker NP, Ramos DM, Li X, Macabeo-Ong M, Jordan RC. Proliferation and invasion factors in HIV-associated dysplastic and nondysplastic oral warts and in oral squamous cell carcinoma: an immunohistochemical and RT-PCR evaluation. Oral Surg Oral Med Oral Pathol Oral RadiolEndod. 2002;94(6):724–31.
7. Silverman S, Jr, Gorsky M, Lozada F. Oral leukoplakia and malignant transformation. A follow-up study of 257 patients. Cancer. 1984;53(3):563–8.
8. Jullien JA, Downer MC, Speight PM, Zakrzewska JM. Evaluation of health care workers' accuracy in recognizing oral cancer and pre-cancer. Int Dent J. 1996;46(4):334–9.
9. Nagao T, Ikeda N, Fukano H, Miyazaki H, Yano M, Warnakulasuriya S. Outcome following a population screening programme for oral cancer and precancer in Japan. Oral Oncol. 2000;36(4):340–6.
10. Sankaranarayanan R, Ramadas K, Thomas G, Muwonge R, Thara S, Mathew B, et al. Effect of screening on oral cancer mortality in Kerala, India: a cluster-randomised controlled trial. Lancet. 2005;365(9475):1927–33.
11. Yu BK, Kuo BI, Yen MS, Twu NF, Lai CR, Chen PJ, et al. Improved early detection of

cervical intraepithelial lesions by combination of conventional Pap smear and speculoscopy. Eur J GynaecolOncol. 2003;24(6):495–9.

12. Sciubba JJ. Improving detection of precancerous and cancerous oral lesions. Computer-assisted analysis of the oral brush biopsy. US Collaborative OralCDx Study Group. J Am Dent Assoc. 1999;130(10):1445–57.
13. Poh CF, Zhang L, Anderson DW, Durham JS, Williams PM, Priddy RW, et al. Fluorescence visualization detection of field alterations in tumor margins of oral cancer patients. Clin Cancer Res. 2006;12(22):6716–22.
14. Thomas G, Skrinska V. Determination of glutathione in human platelets. Clin Chem. 1985;31:350–351.
15. Prazma J, Pctrusz P, Mims W, Ball SS, Weissler MC. Immunohistochemical characterization of nitric oxide synthase in squamous cell carcinoma of the head and neck. Otolaryngol Head Neck Surg. 1995;113:541–549
16. Hristozov D, Gadjeva V, Vlaykova T, Dimitrov G. Evaluation of oxidative stress in patients with cancer. Arch PhysiolBiochem. 2001;109:331–336. DOI: 10.1076/apab.109.4.331.4248.